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Aspects of Village Life in Indo-Pakistan

A. T. A. and A. M. LEARMONTH

The most successful and effective geography lessons are often those in which broad generalizations are made to live for the pupils by the examination of actual examples—a farm in the Corn Belt, a dockyard in Britain or a train journey in Brazil. But the enterprising teacher seeking to use this method is frequently foiled by lack of material suitable for his purpose and sufficiently accessible.

The present article may help by presenting such teaching material on India, not otherwise easily come by.[1] A description and characterization of the Indian village in general is followed—and qualified—by accounts and sketches of sample villages, some actual, some composite, from six widely differing regions. A table is given under each sketch summarizing much material, which must be treated as complementary to the text. Since the same headings are used in each table, they can be assembled to give a synopsis of the article.

From its origins, this work has been oriented towards problems of health and disease, and in shortening it for the present purpose, a similar viewpoint has been maintained in the belief that it will prove of interest and value to the readers of *Geography*.

It must always be difficult to generalize about such a topic as the Indian village, for there are over 650,000 of them in the sub-continent, giving homes to over three hundred million people, in very varied physical and cultural environments. But several commonly recurring features will be described.[2]

(1) In most of rural India, there is some form of grouping of houses, recognized not only as a village but also as a community. In some large areas, however, this grouping is almost absent—in much of the Himalayas, for instance, while other examples are described later. This absence may be ascribed, without undue determinism, to factors of physical geography. Sometimes the grouping is central and compact, sometimes there are several scattered hamlets. The building materials, of course, vary according to climatic needs and available materials. The agricultural villages grade through market villages to small towns. Holdings are normally individual plots, fragmented more through the

➤ Dr. Learmonth is a lecturer in geography in the University of Liverpool; Mrs. Learmonth was formerly a geography teacher. Their paper is based on a lecture given to the Liverpool Branch of the Geographical Association in 1953, in which aspects of the medical geography of Indo-Pakistan were discussed. Both authors make grateful acknowledgment to Dr. Arthur Geddes for his help and inspiration.

particular laws of inheritance, it seems, than through the decay of a system of holding in common.

(2) A pond is almost invariably found and is important to a detailed study in medical geography because of the widely varying extent to which the water is used for drinking, bathing, washing utensils and so on. The pond is often referred to in the literature as a "tank," because in some of the Indian languages the word for a pond, especially an irrigation pond, approximates in sound to our word "tank." But there is no implication of regularity in shape nor of a concrete or metal lining. The pond may be the result of damming a stream for irrigation purposes, or follow even more commonly from surface or seepage water filling a "borrow-pit," that is the hole left after excavating mud for the walls or for the raised platform which forms the site of a house.

(3) There is traditionally a dry dusty open space around the buildings, where the cattle stand; there the weavers stretch their webs (or used to), and any other activity demanding a fair amount of space is carried on.

(4) There is the village tree or grove—perhaps a great banyan tree which has spread by sending down aerial roots until it has come to form a grove in itself, or a mango tree with heavy dark green foliage, giving good shade. This is the village meeting-place, especially for the village elders, and sometimes it has raised platforms of clay for squatting on. Sometimes a sort of village hall has replaced this open air meeting place.[3]

(5) The village temple or mosque—or more occasionally a Christian church—often stands out, and there will be a cemetery if it is a Muslim or Christian village. The Hindu temple is not always maintained as part of an organized church such as we are used to. The altars may be quite small, sometimes almost on a family basis; at them offerings of food are made to a Hindu god, sometimes widely recognized, sometimes quite a local deity or spirit, perhaps associated with a particular tree or stream or rocky hill.

(6) There are some communal economic responsibilities. The most widespread are the maintenance of village artisans—for instance the weavers already mentioned, or the village watchman who is responsible for the registration of health and vital statistics, or village menials such as sweepers (i.e. scavengers), washermen, etc. There are many village officials, some holding hereditary office, but varying greatly in different parts of the country. On adjacent lands there are also usually common grazing rights of rather variable legal status.

The landlord-villages or *zamindari*-villages of most of the north are, on the face of it, associated with a somewhat more democratic organization of joint tenure and local government by a "council of five" or council of elders. This council may have vanished or lost power, but it affords a hopeful means of stimulating a sense of local responsibility in the zamindari areas. On the other hand, the intervention of landlords between the actual cultivators and the State has proved an adverse factor on the whole, and it must be emphasized that only proprietors have rights in the village council or in any communal agriculture that is carried on—landless labourers or menials have none.[4] In the south, where there prevails generally the *ryotwari* system which has given the name *ryot* commonly applied to the Indian cultivator, the land is usually held by owner-cultivators direct from the State, and village government and taxation are generally carried on through an hereditary headman reminiscent of tribal organization, often with an hereditary village accountant to assist him.

The first of our sample villages is situated in coastal Travancore or Cochin; the landforms of the region as a whole are sketched diagrammatically in Fig. 1 and a more detailed view of settlement, landforms and land use is sketched in Fig. 2. The short streams from the Western Ghats are incised some twenty feet into the emerged lateritized plains, while seaward are deltas distorted by very powerful long-shore drift. It is a most striking littoral of sandbars and lagoons.

Groups of men are ceaselessly engaged in winning ricelands from the sea by empoldering; each year three crops of rice are taken from the best land—i.e., the polders or the flood-plains. Fertility is maintained by the use of cattle dung and also green manure from the remaining forests. On the somewhat higher and more lateritized surfaces of the terraces and flat interfluves, millets and cassava are grown by methods showing development from tropical shifting agriculture, using wood-ash as fertilizer. Rice, millet and tapioca (derived from the cassava) all provide mainly starchy food, analogous to our use of bread as a staple "filling" food. Very little fat is derived from milk or butter, but some crops yielding edible oils are grown (including the coconut, the oil from which is used by the family and also sold as a cash-crop). Since most castes abhor meat-eating, there is very little animal protein in the diet, although fish from lagoons and coastal waters is eaten by some castes at least. What protein there is in the diet, then, is derived mainly from vegetables, such as pulses, grown in the "kitchen garden" near the house. But on the whole starch forms too high a proportion, and the diet is ill-balanced. The esteemed and cash-earning spices, and fruits such as mangoes, are minor but quite important features of the land use and the diet.

The settlement type is dispersed rather than nucleated. The houses, separated from each other by orchards, coconut groves or a stretch of cultivated land, contain the related branches of the "undivided family" common in Hindu areas, living in several compartments which face the interior courtyard of the house. The buildings are usually of bamboo and plaited palm-leaves, which are adequate in this equable climate, and only the rich build their houses of brick and tiles. This type of settlement, in sand-bar and lagoon country long inhabited by a dense

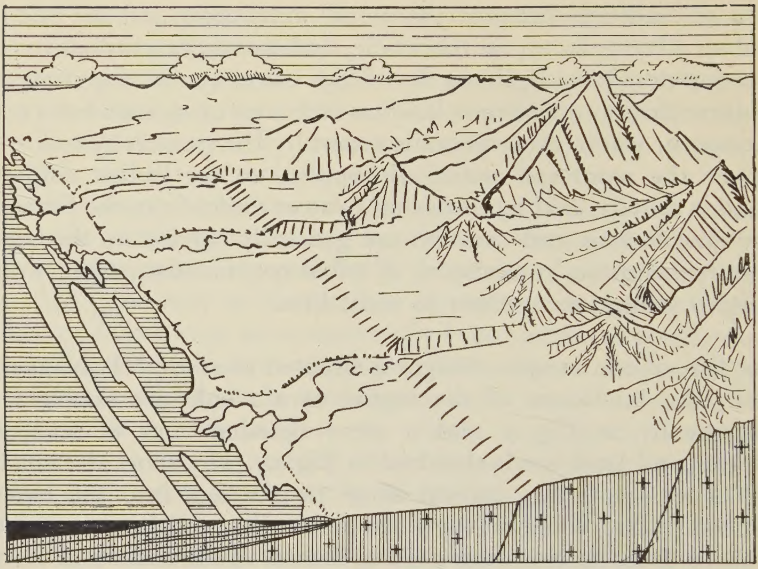


Fig. 1

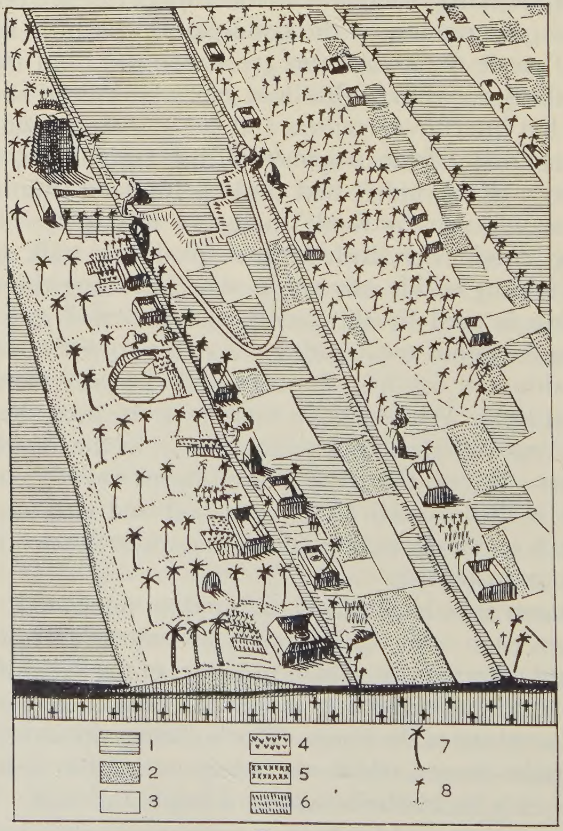


Fig. 2

and industrious population, imparts a distinctive personality to the region, described by an Arabic writer of the 14th century in these words: "The whole of the way by land down the coast lies under the shade of trees, and in all the space of two months' journey there is not one span free from cultivation; everybody has his garden, and his house is planted in the middle of it."[5]

In this region of almost idyllic beauty, the picture is not too unfavourable from the point of view of health. There are ample and reliable rains and varied resources of food. But if the rains do fail, though it be literally only once in a hundred years, the resulting famine is catastrophic. The separate houses have their own wells, so that the incidence of intestinal diseases varies greatly according to the source of water, from household to household. The sand-bars give a reasonable source of water, but contamination is easy. Again, the humid heat encourages flies, which play a big part in the dissemination of certain diseases. Malaria is always present, but is not normally very severe.[6]

The most distinctive feature of the health of these people is the very high incidence of diseases of the stomach, including ulcers and

Figs. 1 and 2.—Malabar, Kerala.

Landforms	*Land use*	*Rainfall*
(a) Sand-bars	(a) Coconut groves, gardens	120 inches annual average, but varies from 60 to 160 inches. 9 to 10 months rain.
(b) Lagoons	(b) Fishing and transport, rice on polders	
(c) Deltas	(c) Rice	
(d) Lateritized low peneplain	(d) Cassava and millets	
(e) Floodplains slightly incised in (d)	(e) Rice	
(f) Ghats scarp	(f) Forests, rubber, spices	

Settlement type	*House type*	*Water supply*
Dispersed, especially linear dispersion or "ribbon development" along sand-bars.	Separate houses in orchard-gardens; rooms for branches of "undivided family" leading on to central courtyard. Thatch and bamboo dominant.	Each house own well, very variable quality, e.g. sand-bar and floodplain.

Population and health	*Diseases*
Density c. 1,000 per square mile. Steady population growth and fair health in recent generations.	Malaria ever-present but only moderately severe. Intestinal diseases very variable house to house (see water supply). Stomach troubles including ulcers and cancers may be linked with rice and tapioca diet.

Key to Fig. 2

1, Water, including flooded paddy; 2, Rice seedlings in rows, peeping through water; 3, Well-grown paddy;
4, Vegetables; 5, Trellis crops such as betel vine; 6, Sugar cane; 7, Coconut palms; 8, Date palms. { There is in fact a great deal of inter-culture, which cannot be shown diagrammatically.

Similar conventions are used in several of the other sketches.

cancers. This is linked with the very high proportion of tapioca in the diet. During the last fifty years especially, the rapidly increasing population has had to depend more and more on this easily grown, heavily yielding crop to supply bulky food, satisfying but dietetically unsatisfactory when it forms too large a proportion of intake. Thus even in this region, long blessed with relative prosperity because of its varied and reliable assets of physical and economic geography, are now to be seen the evils attendant upon ill-balanced diets with too much starchy food. The problem is very widespread throughout the Tropics, and its solution here in south-western India might benefit mankind in other tropical countries and continents.

The second village is situated in the "tank" country of Madras. As the sketch shows (Fig. 3), a stream is dammed by simple traditional means to form ponds or "tanks." They are primarily for irrigation, but the water is used for washing utensils and clothes, and in places even for drinking. Some of the irrigated plots are heavily manured, so that water pollution is inevitable and intestinal diseases are endemic. Malaria is also always present, but is very patchy in incidence, since large tracts of country are beyond the mosquito's effective range from water suitable for breeding (i.e., about half-a-mile); at worst it is very severe indeed.

The pattern of settlement in the sketch is of two loosely agglomerated hamlets making up each village—one for the upper castes, cultivators and others (note the temple in the Brahman village) and the other for the low castes and casteless peoples such as the sweepers or scavengers, the oil men, or the leather workers who handle material from the dead body of the sacred cow. This village-form is common in southern India, and conditions in the low-caste hamlet are often very poor and backward.

Irrigation as always has a stabilizing effect, and the people are normally fairly well-fed and prosperous. But irrigation here can only store some of the stream-flow for use over a longer growing season in a single year; it cannot hope to husband water from a wet year for use in a subsequent dry year, and cannot prevent privation should the rains fail.[7] This has actually happened in six successive years recently causing real famine, with actual deaths from starvation in the area.

The third "village" is sketched in Fig. 4. It shows a group of densely peopled islands above the flood-level in the active eastern delta of Bengal during the rainy season.[8] Settlement is of a very dispersed type, and the term "village" is often inappropriate. There is a relatively high standard of material life, and of health. The fertility of the soil is renewed by flooding each year, and rainfall is ample and reliable. Natural and artificial processes make new land available for cultivation. These tree-fringed island-sites are separated by water in the flood season, by stretches of growing crops or of tall grass in the

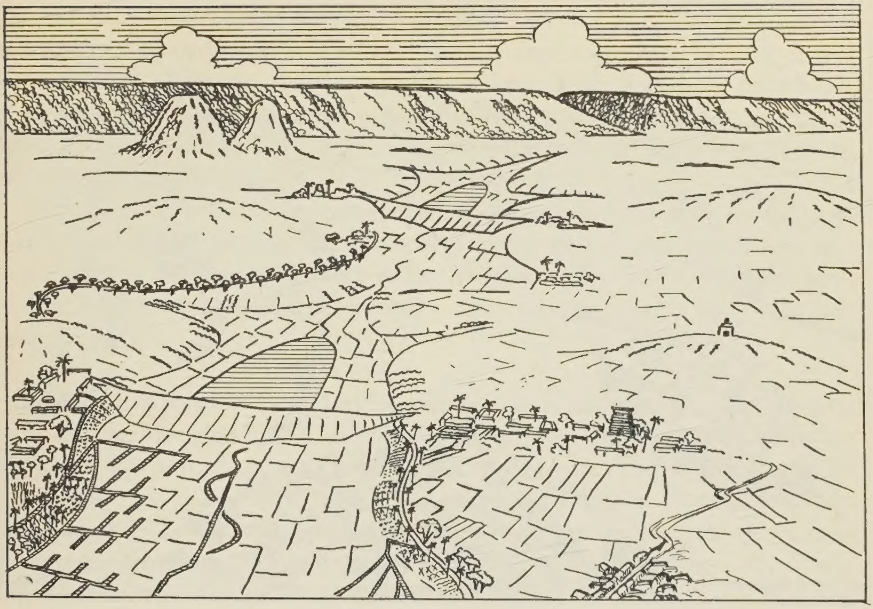


Fig. 3.—"Tank" country of Madras.

Landforms	*Land use*	*Rainfall*
Post-mature gently rolling surface		35 inches annual average but often under 30 inches. 9 months over 1 inch.
(a) Valleys	(a) Irrigated orchards and gardens (palms, fruit, pulses). Then rice plots.	
(b) Rolling surface	(b) "Poor" millets (low esteem and social connotation, good nutritionally)	
(c) Whalebacks and inselbergs (little soil over gneissic rocks)	(c) Scrub, rough grazing (over-grazed)	

Settlement type	*House type*	*Water supply*
Village at end of irrigation dam. Loose aggregation; often two hamlets, one high-caste, one low-caste.	Mud and thatch or tile. Low-caste hamlet often in very poor state.	Wells, but tank-water used for washing clothes, utensils, bathing, etc. (polluted by irrigation of manured plots upstream).

Population and health	*Diseases*
Density c. 200 per square mile. Normally irrigation helps to stabilize conditions but if severe failure of rains famine and concomitant disease. Too small a margin in a really bad year or succession of bad years.	Constant, often severe malaria (stagnant water of tanks). Intestinal disease (use of tank-water). Houses not so close as to compel good sanitation but not far enough apart to prevent spread of infections.

cool season, or by embanked stubble fields, sand-banks and creeks in the hot weather. An island-site is usually occupied by a handful or a sprinkling of families with little corporate spirit or activity.

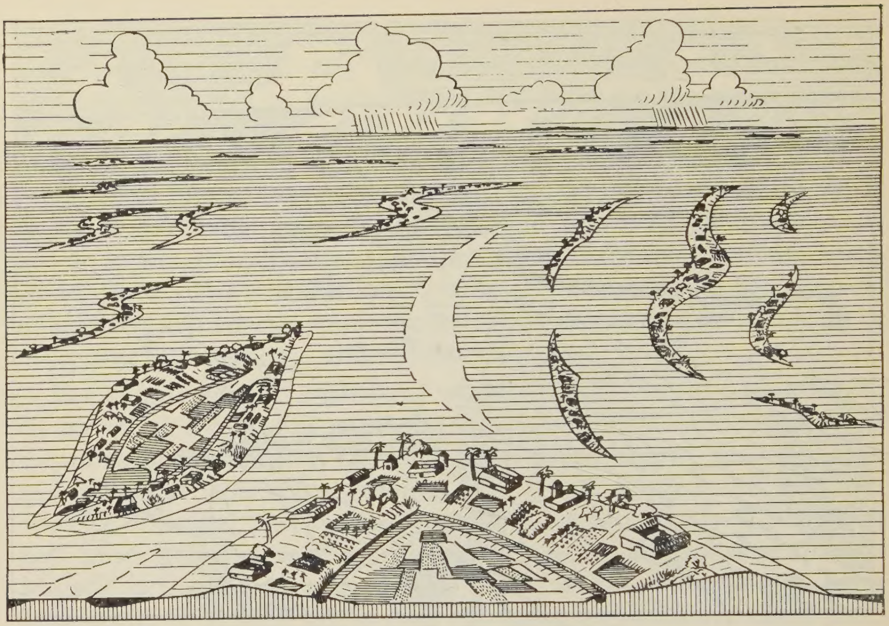


Fig. 4.—East Bengal.

Landforms
"Active" delta, shifting channels and banks, "hollow" islands (see sketch and text).

Land use
Gardens on lighter soils on upper banks. Rice and jute in flooded fields. 30% double cropped.

Rainfall
Over 60 inches annual average but varies from 50 to over 80 inches. 10 months over 1 inch; 6 months over 5 inches.

Settlement type
Very dispersed along banks of present and former distributaries.

House type
Bengali variant of "undivided family" house, courtyard, tank, and orchard or grove of bamboo. Mud and thatch, now some cement.

Water supply
Wells, but tank and river water used for bathing, etc.

Population and health
Density 1,000 to 2,000 per square mile. Good state normally; reliable rains; rapid increase; Muslim population; fewer restrictions in diet.

Diseases
Malaria incidence not severe (flushing of waterways). Intestinal diseases variable (chances of pollution of households' water supply, increased risks as floods recede especially in "cholera year").

The lucrative cash crop of the region, jute, occupies about 50 per cent of the land, and this has raised the economic status of the people even while the population has rapidly increased; but its cultivation to such a great extent demands the import of rice in large quantities. Health is safeguarded to some extent by the natural "flushing" of the water channels each flood season, which inhibits the particular species of mosquito locally prevalent and prevents severe incidence of malaria. The flood may often give a respite from intestinal diseases but these often return as the waters recede. There is in this area a tradition of the use of a rudimentary form of latrine, but the effect on the spread of intestinal disease varies widely. The amount of pollution may differ, for instance, according to the size of the island-site and how congested it is, or again pollution of the surrounding waters may not matter if they are undrinkable because of the high proportion of salt from tidal influences.[9]

The picture is far from unmarred by adverse influences on health, but there is good ground for optimism about the future because of the sound economic bases, because of the vigour of the people and because of the foundation of simple sanitary practices on which the reformer may build.

A fourth village is sketched in Fig. 5. It is situated in the western part of the Ganges-Brahmaputra delta—a "dying" delta in contrast to the active delta just examined. The stagnation of the river channels is reflected in the complex of diseases and the poor physique of the inhabitants. The silt is no longer renewed, and leaching of the soil is going on. Stagnant water can be seen everywhere—behind carelessly engineered rail and road embankments, in ponds behind small dams across the water-courses used for local irrigation in the cool season, and in the tanks—here used mainly for ceremonial and washing purposes and often rather neglected. All these give harbourage to the mosquito larvae. And many are at least partially covered by the water hyacinth—the 'lilac devil'—which spreads into the paddy-fields and reduces the yields.

Seventy per cent of the inhabitants cultivate their own land, usually as rice-growing and rice-eating subsistence farmers. Yet the great industrial conurbation of Calcutta–Hooghlyside, some thirty miles away, is of importance, for in two ways it adds to the cash income required to buy in additional rice to tide over the lean time before the main autumn rice harvest. Firstly, some of the inhabitants travel daily to the city to work, or migrate there for shorter or longer periods, and send some of their earnings home to the village. And secondly the great market there attracts much of the fruit, vegetables, milk and eggs from this countryside; this is a tragic instance of the economic influence of a great city, for all of these foods of high nutritive value are required just as much in the villages as in the city.[10]

Fig. 6 shows a good house in this area. The courtyard may be covered by overhead trellis work on which a climbing plant—often a pumpkin—is grown. Near the house is seen the tank; and beside it the date palms to be tapped for syrup or toddy. The health and status of the people is unsatisfactory. Much disease is related in some way to the innumerable pools of more or less stagnant water. Malaria is always present, and in severe and depressing form. Although few, except the poorly regarded Hindu widow, now drink habitually from tank or stream, ritual cleanliness demands bathing, invariably including

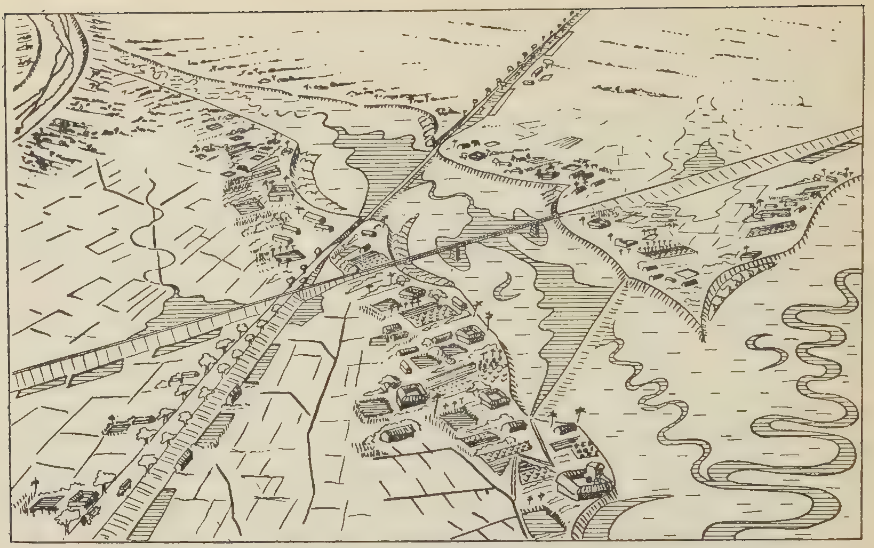


Fig. 5.—West Bengal.

Landforms
"Dying" delta—local drainage only, by former distributaries.

Land use
80% cultivated; autumn rice, some jute, vegetables. Poor cattle. Dormitory element; work in Calcutta area.

Rainfall
50 inches annual average but varies from 35 to 60 inches.
9 months over 1 inch; 6 months over 5 inches.

Settlement type
Loose agglomeration tradition of separation from neighbours. Not so tied to raised banks as in East Bengal.

House type
Bengali variant of "undivided family" house, courtyard, tank, and orchard or grove of bamboo. Bamboo and thatch, now some cement.

Water supply
Wells, but tank and river water used for bathing, etc.
Drinking water now mostly tube-wells.

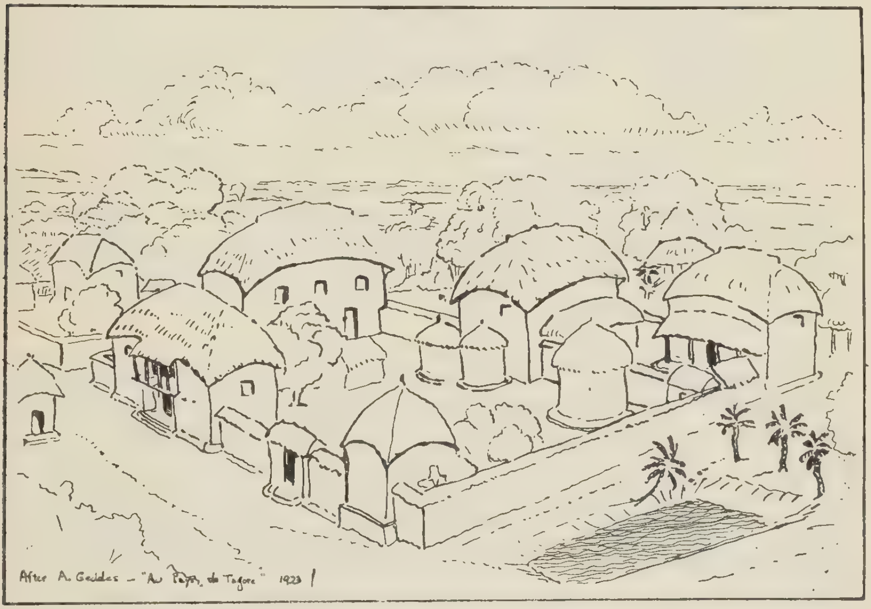
Population and health
Density c. 1,000 per square mile. "Stagnation" (see text). General malnutrition, poor physique and health.

Diseases
Hyper-endemic malaria (stagnant water in channels in dry season, and many other water-bodies). Intestinal diseases, flies and some use of polluted water (poor sanitation), tuberculosis and leprosy make even rural over-crowding bad. Influenza, etc. in cool season.

washing out the mouth, in such polluted places.[11] Sanitary practices are extremely primitive, and the search for privacy often increases the chance of pollution of the water bodies. There is the terribly wasteful combination of a high rate of births and a heavy infant mortality. The cool season, seeming so pleasant to the European, brings influenza and pneumonia to the scantily clad Bengali peasant, with his one hot meal in the evening, and early cold breakfast of left-over rice.

The relations between health and the whole environment of the people have been carefully surveyed by devoted workers in a study in social medicine after a geographer's own heart.[11] Wise leadership may yet restore the former prosperity and vigour of West Bengal.

Fig. 7 is a composite portrait and cannot therefore be given too precise a location; this village belongs to the northern fringe of Central India, just before the crystalline peneplain and old continental sediments descend—usually fairly gently—beneath the southernmost of the alluvial sediments of the Gangetic plain. There is some resemblance to an English landscape, perhaps in the Yorkshire Wolds, with a nucleated village among trees and then a wide view of stubble fields. But closer examination reveals an unhappy picture. Instability is the key note in this region where the monsoon rains are unreliable. " One lean year in three, one famine year in seven" might well apply to this village. The soil is lateritic, and has not stood up well to being cleared for the growing of cereals. In places accelerated soil erosion has eaten into the surface to form badlands; elsewhere it has left a bare pavement like a red slag tennis court, or even like a sheet of rusty iron. At best it is baked hard during the hot weather, while during the torrential, patchy storms of the monsoon, sheetwash glides downhill semi-viscous with suspended top-soil. Deforestation aggravates the process and may be one cause for the use of cattle-dung as fuel, instead of as manure. And in turn the gullies cause local lowering of the water-table, thus adding to the agricultural difficulties.



After A. Geddes – "Au Pays de Tagore" 1923

Fig. 6.—A house in West Bengal.

This is a landscape of dry-farming, although patches of paddy may be found in the flood-plains of larger streams. There is very little irrigation from wells, only perhaps a few much-valued crops round the village, such as sugar cane and opium poppies. Wells are nevertheless crucial, for man and beast. They are mainly deep and permanent wells, capable of giving good water, but there are many dangers to health; modern tube-wells, sealed and protected from surface seepage by concrete aprons, should therefore be substituted for the picturesque draw-wells and step-wells of tradition.

Variability is characteristic of the climate, the population trends and the health of the people.[12] Malaria has not the constantly depressing effect upon the people found in West Bengal, but occasional epidemics are of great severity. Again this was one of the areas most severely affected by the great influenza pandemic of 1919. Plague too has ravaged these villages.[13] Most sinister and most fundamental of all, perhaps, is famine, or near-famine. Many of the villagers have become land-less labourers, often because of the activities of money-lenders, and must till the land for wealthier land-owners under a system of share-cropping. In a lean year or a famine year, this most vulnerable class will eat bread with too large a proportion of flour from a kind of vetch which grows freely even during a drought. Eaten thus in excess, this vetch flour has severely poisonous effects and up to ten per cent of the male population, the young men especially, may in consequence become paralysed from the waist down, for life. Here in extreme form is found the problem of overpopulation by subsistence farmers of land marginal because of variable rainfall.[14]

The last village, in the hill-foot District of Sialkot between the Ravi and Chenab rivers, is sketched in Fig. 9. It is in an area densely settled from ancient times by an industrious population dependent mainly on well-irrigation. It is situated on relatively fine alluvial deposits, away from both the coarser detritus of the alluvial fans or cones of the great rivers, and from the zone of coarse gravels deposited by streams from the outer slopes of the Himalayan foot-hills (see Fig. 8).

The site of the markedly nucleated and walled village has become slightly raised above the general level of the plain as each house has been built upon the ruins of its predecessor; this is a measure of the immensely long period of settlement, and of the aridity of the climate.

The vital foci of the economic life of the village are the deep wells, tapping water-bearing deposits often many feet below the surface. Alternations of sand and clay in the understructure of the great alluvial plain trap the water, often with semi-artesian effect. One well may water perhaps 20 acres, the irrigated portion of the holdings of at least half-a-dozen families. Crops on these irrigated and well-manured patches are varied, but wheat is the esteemed cool-season crop; it is grown also on the best unirrigated land. Consumed in the form of

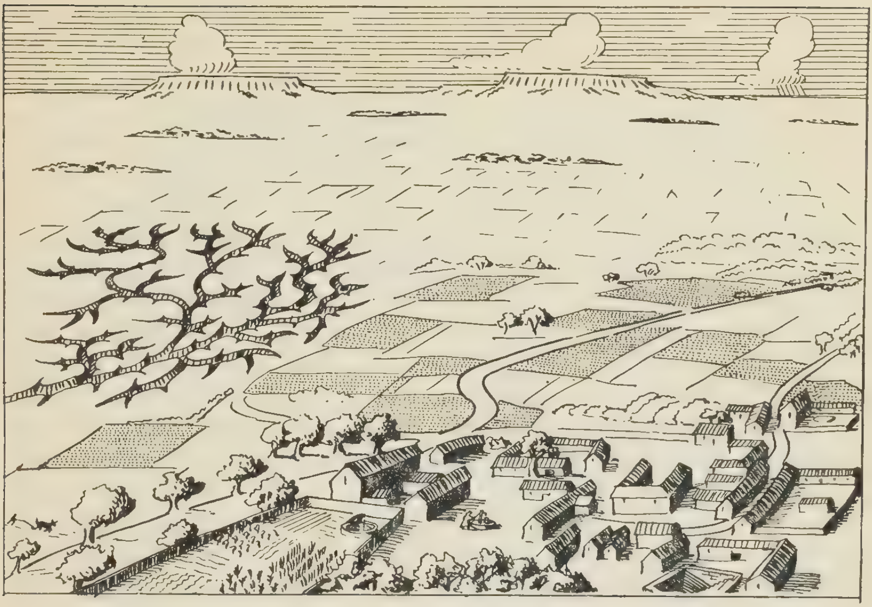


Fig. 7.—Central India.

Landforms
Plateau; very level surface cut across crystallines and old sediments. "Badlands" eating into red tropical soils.

Land use
Dry-farming of wheat (cool season) and millets, oil crops and pulses. Well-irrigation; vegetables, etc. Some rice (floodplains of larger streams).

Rainfall
30 inches annual average but often under 25 inches, and occasional big excess. 3 to 4 months rains.

Settlement type
Nucleated. Well-marked village streets.

House type
Mud, brick or bamboo walls (too thin in cool season). Pantiles.

Water supply
Deep masonry wells, variable protection from surface seepage.

Population and health
Density c. 200 per square mile. Fair health in good year, but whole economy and life unstable (recurrent crises).

Diseases
Occasional, i.e. epidemic, malaria. Influenza, chest and lung troubles in cool season. Plague (rats in walls and roofs).

whole-meal pancakes, eaten with savoury dishes, wheat has an important effect on the health and stamina of the people. Furthermore there is something of a pastoral tradition in this part of Pakistan, so that milk and butter form a valuable part of the diet. The close integration of cattle in the economy is noteworthy. In such an intensively cultivated area the cattle are not allowed to roam but are largely stall-fed—an example to areas even quite close by where soil erosion is being caused through over-grazing of scrubby slopes. Thus dung is available for manure, along with night-soil and refuse, while cattle and goats from adjacent hill country are brought down for the purpose and folded on the most valued fields.

The houses are like those of the Holy Land—built for coolness during the day and to some extent for warmth in the cold nights of the cool season, while the flat roof provides an extra "lung" in the cool evening time. Ventilation and lighting are poor in older houses, and added to this is the persistence of the system of "purdah"; because of these factors women are the chief sufferers from several of the diseases particularly associated with the area. Vicious epidemics of cholera may sweep the area, spreading from village to village through marriage feasts, which always involve two villages, and religious festivals great and small. Plague too can be serious, for rats thrive in the thick walls. Tuberculosis and adult rickets, the latter especially in women during and after pregnancy, are far too common; largely the problem is that of changing a way of life in which women spend too much of their time in such ill-ventilated dwellings. Similarly the poor sanitation affects the women more than the men who are out in the fields all day.

But more enlightened ideas are spreading fast in the new and vigorous state of Pakistan, and great improvements are certainly practicable when there are present such weighty favourable factors as those described.

Figs. 8 and 9.—Punjab hill-foot.

Landforms
Zone of heavier soils between two of great river fans and away from coarse gravel zone, deposited by torrents from outer ranges of Himalayan foot-hills.

Land use
Well-irrigation; wheat (cool season), cotton, opium, vegetables, some rice, sugar. Dry cultivation; millets (summer), some wheat (cool season rains).
Scrubby pasture; cattle but these largely stall-fed here.

Rainfall
35 inches annual average but varies from 10 to 60 inches.
4 months in cool season, from depressions; 3 to 4 months in monsoon.

Settlement type
Very nucleated (water and defence). Often walled. Raised site.

House type
Thick mud walls.
Internal courtyard very well marked (purdah).

Water supply
Deep masonry wells, variable protection from surface seepage.

Population and health
Density c. 1,000 per square mile. Good state and rapid increase of population. Associated with more use of meats and milk products and eating of wholemeal wheaten pancakes.

Diseases
Autumnal malaria, swells to epidemic in wet years (usually). Fly and water-borne diseases in wet season. Cholera epidemics (religious fairs, etc.). Plague (rats in walls). Tuberculosis, etc. Women particularly affected by several of these diseases (purdah).

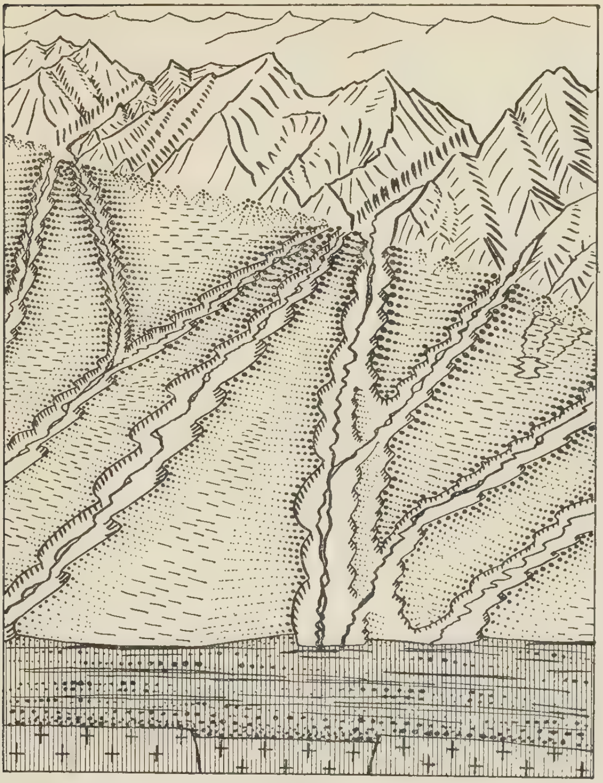


Fig. 8.

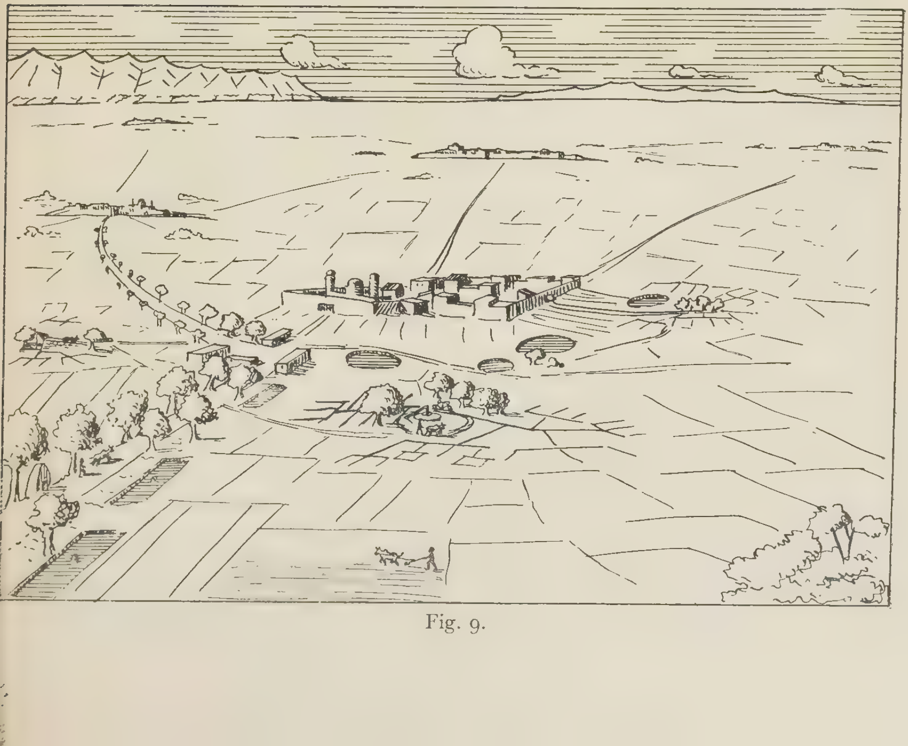


Fig. 9.

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The Anatolian Village

W. C. BRICE

A RECENT DESCRIPTION OF LIFE in a Turkish village[1] caused considerable political stir in Ankara. The author, a young Turkish schoolteacher, wrote his books in order to expose what he regards as the poverty, ignorance and hardship of the village life which he knows. He contends that the changes started under the Republic, such as the secularization of education and the mechanization of agriculture, have made far less impression on the Turkish peasantry than townsfolk often realise, and that the government has a duty to quicken the pace of its reforms.

Makal certainly gives an exaggerated picture of the backwardness of Turkish village life in general, partly because of the youthful earnestness of his outlook, and partly because the villages he describes are in a very isolated and semi-desert part of the central plateau, and thus are not typical of the whole country. Even so, it is clear that villages in every part of Turkey, as in many other countries of southern Asia, are still experiencing only the beginning of a profound revolution. Makal's appeal, therefore, raises the important problem of whether the changes he advocates will strengthen or weaken the villages they affect.

Makal does not expect the latter. O. H. K. Spate, however, speaks in a recent paper[3] of the "disintegration" of village life in India, caused by processes of change similar to those which Makal recommends. This argument is inspired by the pamphlet by Karl Marx to which Professor Spate refers his readers.

But it is by no means certain that new methods of farming, trade and government will necessarily break up traditional village life. Their effects, of course, can only be accurately measured by detailed economic inquiries of the sort which Professor Slater arranged near Madras.[3] Meanwhile, it may help in judging these contrasting theses to describe the topography and economy of an Anatolian village; to trace the history of some of its features; and in this light to estimate the extent of past and present changes.

Harran

The upper valley of the Jullab river cuts into the limestone plateau of southern Turkey, which is a transitional region between the Kurdish hills and the high plains of North Syria. At regular intervals of about five miles throughout the valley are small villages, each clustered near a water-hole or well, and usually on the slopes or in the shadow of a mound which is composed of the residue of a succession of earlier villages. In the centre of the valley, the village of Harran occupies

➤ Mr. Brice is a lecturer in geography in the University of Manchester.

part of the ruins of the ancient commercial city of the same name.[4] (See Fig. 1 and Plate I.) The inhabitants, numbering about five hundred, live in detached households, each inside a walled compound. Most of these dwellings are scattered irregularly throughout the village area near the ruins of the mediaeval castle, but there is a subsidiary group of houses inside the ruins of the west wall, and several separate farms in more outlying positions. A typical house consists of a court with mud-brick walls, into which the animals are driven at night, and a building of three or four rooms, single-storeyed, and roofed with a series of between two and eight high cupolas (Plate II). The population is Arabic-speaking, and belongs to the Beni Nimr tribe, the head of which enjoys a high prestige, although his home is as humble as any in the village. All are farmers, except for a few general storekeepers and the owner of the coffee-shop in the market-place, the builders, the miller (who has a small oil-driven motor mill), the prayer-leader (*hoca*), the schoolmaster, the district governor (*müdür*) and the detachment of gendarmerie.

The mosque lies outside the ruined walls to the west, and is an ancient building enclosing the tomb of Sheikh Hayat-al-Harrani, the eponymous ancestor of the village. Though long dead, he still intervenes in the life of his descendants, as is shown by numerous scraps of clothing tied to the gate of his tomb, each representing a wish, vow or prayer. The *hoca* leads Friday prayers in the mosque, and receives in return a small payment in money or kind from the community. Other public buildings, the school, post-office, governor's office, gendarme post, and government store are comparatively new. They are set apart from the dwelling-houses, and are generally constructed with gabled roofs of imported sheet-iron and timber.

Drinking water must be carried on donkey-back, in pairs of four-gallon petrol tins, from Jacob's Well, the only source of sweet water, about a mile away to the west. The well under the castle wall provides only brackish water, suitable for animals or for washing, as do a few smaller wells among the ruins. Leading water is the task of women and children, and the well is their "social centre" in the same way as the coffee-house is that of the men.

The farm land extends over the plain in all directions around the village. Tenure is usually freehold, and most of the farmers are peasant proprietors. Individual holdings are normally in scattered plots, due to the operation of the Moslem system of dividing a man's inheritance equally among his widow and sons.* Holdings are marked off by boundary stones or by low ridges, and vary in value according as they receive only rain-water or can be irrigated from the Jullab. The river is here two narrow ditches, one on either side of the village, and only provides water for a few fields of cotton; Harran is without the irrigated plot of closely planted póplar trees, grown for building

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* By modern Turkish law the daughters also receive shares.

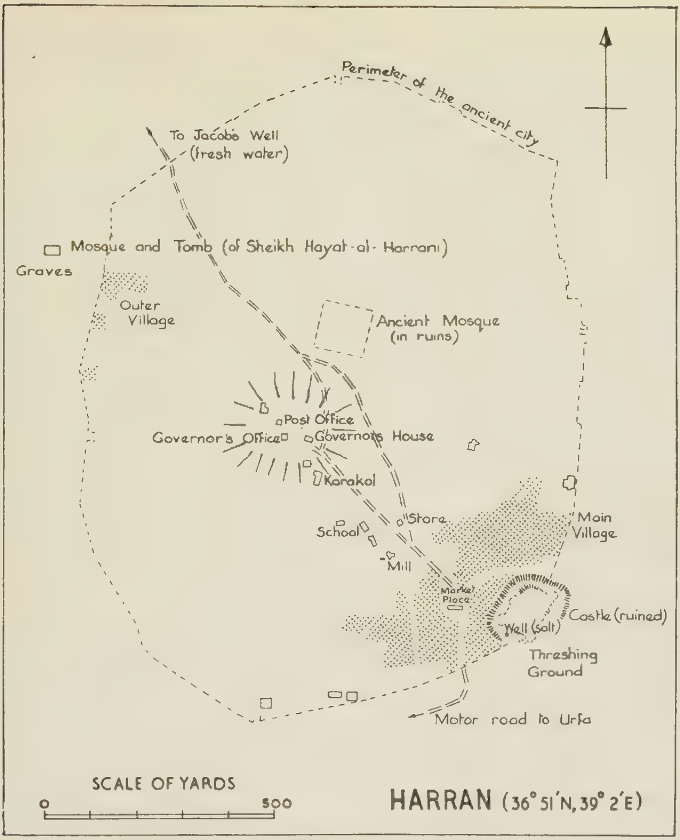

Fig. 1.

timber, which is found near most villages. Irrigation water is available to any fields which abut on the stream. There is no strict law governing the amount which can be drawn off, but custom and tradition limit the quantities which may be used by each farmer, and any disputes on this head would be decided by the sheikh of the village.

Unirrigated crops consist of wheat, barley, millet and sesamum. Agricultural tools, which are few and simple, include the light scratch-plough, wooden harrow, hand-sickle and finger-guards, flint-set threshing sledge, and wooden winnowing-fork and sieve. The long process of threshing and winnowing is carried out in midsummer in an area of common land beyond the castle, where each household can claim a patch for its own use. The government now loans harvesting machinery with tractors and drivers to the village for short periods in the summer. At a small charge, these effect great economies in time and labour.

A flock of sheep and goats is kept by most villagers, and some also possess a few small plough-oxen, draught-camels and horses for riding. In spring, pasture is found on the fallow or among the ruins near the village, where the ground is common property, and where all are free to gather brushwood or hay. In the threshing season of midsummer, the animals are kept in the village and driven out daily to feed in the stubble. In November, after the harvest, they are taken by a small party from the village into the high pastures of the Tektek Dağ to the east, where water and dry grass are more abundant. These winter migrants live in tents for three or four months, and wander widely over the plateau in search of water and pasture. Several villages send herdsmen and flocks into this region, and there is no division of territorial rights, as grazing-ground is abundant.

From time to time, a few tents of pure beduin families attach themselves to the outskirts of Harran. These people are stragglers from the outer wilderness, driven by some necessity to live as economic parasites by the villages of the desert-edge, and to exchange the produce of their herds for straw or grazing facilities. They are always despised as the "homeless ones," and their tents are kept at a distance from the houses. Some at least may eventually be accepted into the village community, but only after a long and difficult probation.

Situation and architecture of the Anatolian village

The three essentials which must always be found near the Anatolian village are water for drinking and irrigation, cultivable land and grazing grounds. In alluvial plains like the valley of the Jullab, where water is widely available from streams, wells or rain-ponds, the villages are spaced at regular intervals. Much of Anatolia, however, consists of dry depressions of inland drainage, with stony and often saline soil. In such districts, a characteristic situation for a village would be just at the mountain foot, where bare rock meets the gravel and alluvial detritus of the lowland basin or plain, and at a point where a stream or spring provides constant and reliable water, before being dissipated in the open lowland. The advantages of such a position are proximity to high summer pastures, and probably also to timber supplies on the middle mountain slopes, a regular water-supply which can be controlled and used for irrigation over the "delta" of soil and gravel stretching out into the plain, and flat land for unirrigated grain-crops or in-field pasturage. In this description there is in mind a series of small villages around the edge of the intermontane basin of Elbistan in Cappadocia, but the type could be matched frequently in almost any part of the Anatolian plateau.

A well-built village house would include a courtyard for cooking and for enclosing animals at night, a storeroom and stable on the ground floor, and two or three sleeping and dining rooms, for men, women and guests. These are on the upper floor, reached by an outside stairway. Beds are made up on the floor, and rolled and stored in wall-cupboards or shelves in the day-time. Details vary, and in many single-storeyed houses sleeping accommodation is on the roof, and a barn for the animals is dispensed with.

Styles of architecture vary with the local building materials. Most common is the one- or two-storeyed house of sun-dried mud bricks, with a flat roof of mud resting on poplar beams and brushwood. The roof is patched with mud and rolled smooth each year before the rains, and is used for storage or for sleeping. It usually projects to form a simple verandah, with a colonnade of poplar uprights. Windows are simple shuttered openings. In the more elaborate form of this house, timber trusses are built into the walls for additional strength, and latticed windows are set forward on wooden corbels, oriel-fashion; but these refinements are more common in towns than villages. A common addition in Cappadocia is the high chimney-like ventilator.

Although mud bricks are the usual building material, where stone is abundant and easily worked, as in the gneiss district north of Muğla in Caria, or in the lava-fields near Lake Van, it usually replaces bricks for the walls. Sometimes in the larger stone-built houses of Caria, a central wooden column helps to support the framework of the roof.

Wooden houses with gabled instead of flat roofs are most common in Pontus. In Caria and Lycia this type of building is more usual for grain-stores than for dwellings, but the famous rock-cut mausolea of these districts show every detail of what must have been once a common style of timbered domestic architecture.[5]

Near the north Syrian border, as at Harran, a high corbelled dome, set on primitive pendentives over square rooms, is an ingenious device for dispensing with timber, even for temporary centring.[6]

The permanence of village sites and village economy

In Cappadocia, almost every mountain-foot spring is marked by both a modern village and the mound (*hüyük*) of ruins of ancient villages, where the pottery often proves continuous occupation over some 5,000 years. The same has been observed in the Harran district, where each village stands on the ruins of its earlier precursors. It seems that the same spring or well which dictates the situation of the present village attracted the first farmers of Neolithic times, and the life of the settlement has continued with little change ever since. In remains dated to the third millennium B.C. at Mersin,[7] for example, were found closely packed mud-brick houses, grain silos, and sickle-flints, while the stone saddle-querns and mortars were so similar to those still made, that the villagers took them from the excavations for their own use.

This continuity of village life is remarkable in view of how frequently immigrants with other economies and traditions have entered the plateau. In particular Asia Minor has been invaded by many waves of pastoral nomadic folk, but each time this has happened the Anatolian village has been able gradually to win over and absorb the intruders.

This process is still not complete, and in some parts of Anatolia, notably in the Taurus mountains, nomadic Turkish tribes, called

"Yürüks" or "Göçebes," have not yet settled to village conditions. Sometimes such tribes, while still practically independent of the government, encouraged Greek and Armenian artisans and farmers to settle in their territory, and gradually themselves took to village life by imitation. In other cases, as has lately been described in Cilicia,[8] the tribe was first compelled by the government to settle, and afterwards brought in craftsmen to work with them.

The profound changes involved in the adoption of the village economy by a tribal group make necessary a slow and methodical adjustment. Too rapid a change may end disastrously. Ramsay saw such a case, where a Mongol tribe, newly arrived in the central plateau and unused to cultivation, failed to adapt themselves and became extinct.[9] A similar experiment is now being undergone by the Khazak nomads who have been evicted by the U.S.S.R. and granted asylum by Turkey.

It appears, therefore, that the exact methods by which newcomers adjust themselves to village life vary greatly, yet wherever they make the change they adopt the agricultural economy, techniques and tools which have been known in Anatolia for 5000 years.

The rural religion of old Anatolia

Of course the Anatolian village, while retaining its traditional economy, has undergone several changes of language and religion during the turbulent history of the country. Yet even in these respects it has shown an obstinate conservatism. The old Asianic languages, for example, continued to be spoken in many remote districts long after Greek had become current in the cities; and in spite of the Turkish conquest, Greek-speaking villages survived in parts of the central plateau as well as near the west coast until the movements of population which followed the First World War. Again, both Christianity and Islam in Anatolia took over institutions and beliefs from the old pagan Anatolian cults. Makal has shown that the dervish orders, though officially banned, retain considerable power in the countryside, and that pilgrimages are still made to holy places. Equally unorthodox, but certainly very common, is the reverence for the saints whose tombs are found in many villages, and who often, as at Harran, represent the "spirit" of the place.

These are only the last vestiges of a once vigorous rural religion, which not only maintained, by means of strict sanctions, respect for long-established farming methods, but also was responsible for constant improvements in these techniques; for many of the old pagan sacred colleges of priests acted as agricultural experimental stations, each with its special sphere of research, such as goat-herding or the keeping of bees.[10]

There is much evidence that the manifest degeneration in the Anatolian landscape which has taken place since classical times is due to the weakening of this old rural religion under the successive onslaughts of Roman emperor-worship, Christianity and Islam. Many ancient skills, for example some of the arts of olive grafting, the pollination of the fig and the construction of terraces, have been forgotten. Hillsides have been stripped of trees, and once fertile lowlands encumbered with silt.

Modern changes in the village

The Turkish government is now trying to make good much of this damage by means of river-control and the draining of swamps. In addition, its agricultural policy includes the reform of the systems of land-holding and a programme of research into the conservation and efficient use of soil and water.

By a law which was passed through the National Assembly in 1945, no-one is permitted to retain more than 450 hectares of land, and provision was made for the distribution to farmers of land owned by the state, by private landlords, or by religious foundations. Formerly the Anatolian villager had worked as a tenant at successive periods on pagan temple lands, on Roman imperial estates, or on Ottoman feudal domains (*çiftliks*). Now for the first time he has become an independent proprietor.

This change has brought increased responsibility as well as more freedom, for under the old systems of tenancy all important decisions were taken by the landlord. In this respect his place has now been taken by the state, which through government-aided co-operatives provides the farmer with money credits, mechanical equipment, improved strains of seeds, and facilities for storing, transporting and marketing his produce.

The farmer is being taught to conserve his soil by protecting woodland, by planting shelter-belts, and by terracing his steeper fields, and also to improve his seeds and stock by careful selection and breeding. Skills like these were probably generally practised in pre-Hellenistic times, but having since been abandoned, they have had to be learned anew. With these exceptions, the government is wisely retaining much of the old agricultural practice. Such machinery as is being loaned to the farmers—tractors, harvesters and motor-pumps, for example—is intended to lighten the toil of farm work rather than to replace traditional implements and techniques. These have been evolved by centuries of experience to suit local conditions of climate, soil and labour, and in these circumstances could probably not be improved. Consequently, local styles of architecture are allowed to continue; more than 90 per cent of Turkey's cereals are produced on land cultivated with the simple wooden scratch-plough; and over much of the plateau farm produce is still taken from the village to the railway on the heavy wooden wagon with solid wheels and fixed axle, which has done duty here probably since Neolithic times.

Comparisons with the Indian village

As in India, the horizons of the Anatolian village have widened enormously in recent years. Yet it must not be too easily assumed that new techniques of farming, administration and transport necessarily damage the fabric of established village life. This is the theory implicit in Marx's pamphlet to which Professor Spate refers, and it is open to challenge on many grounds. In Turkey, improved communications have made possible more efficient administration and garrisoning of the countryside, and the virtual elimination of wasteful feuds between different quarters or families in the villages. Touring veterinary and medical services visit the most outlying districts, and the schools have taught new high standards of hygiene and co-operative enterprise for improving sanitation and water-supply. Agricultural colleges give instruction to selected boys from the villages, and these colleges are placed in the country so that during their period of residence the boys are not influenced by city manners and standards. Similarly, girls are chosen from village schools and taught handicrafts at girls' institutes, and return to the villages to pass on what they have learned.

British administration naturally effected many changes in the life of the Indian village. Yet the experience of the Turkish village would suggest that they were not as disruptive as is suggested by Professor Spate. The railways, for example, not only brought material benefits like relief in time of famine, but strengthened native religions by making pilgrimage to holy centres much more easy than ever before. Our administration encouraged and relied on the traditional system of village government by the *panchayat*, while co-operative investment and marketing have been as beneficial to the villages of India as to those of Turkey. It is suggested that recent changes in the rural economy of both countries, far from weakening the villages, have in various ways given them new vigour and cohesion.

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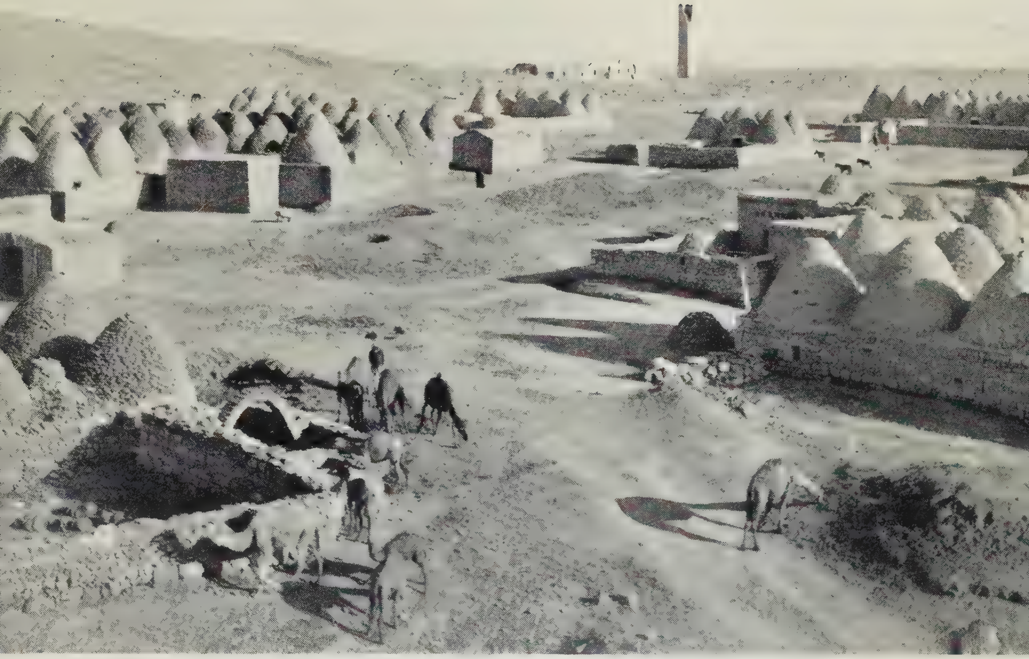
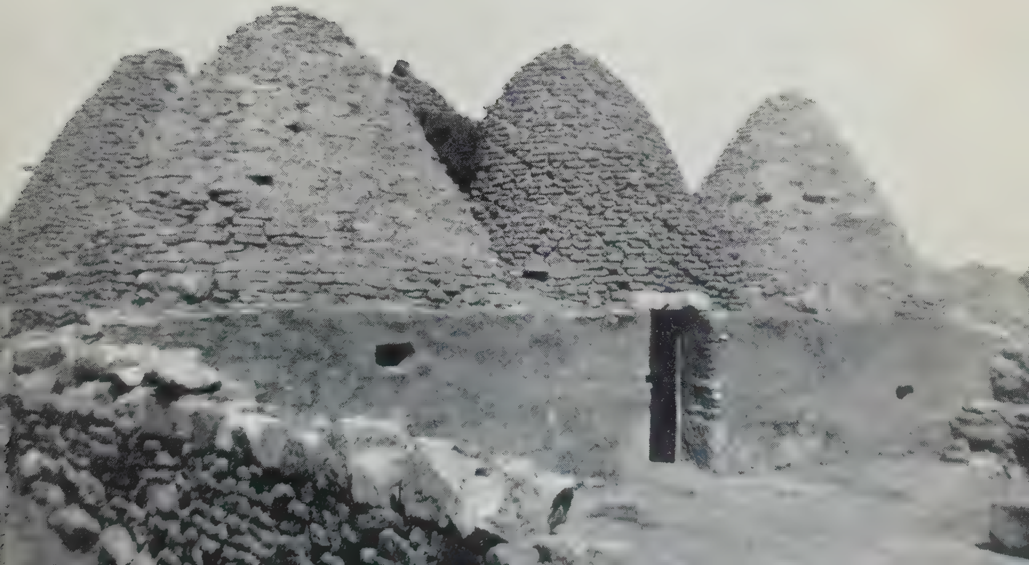


Plate I.—View of Harran looking northwestwards from the castle over the centre of the village, with the ruins of the ancient mosque in the distance. (*Photograph by Dr. Storm Rice.*)

Plate II.—A house in Harran. (*Photograph by W. C. Brice.*)



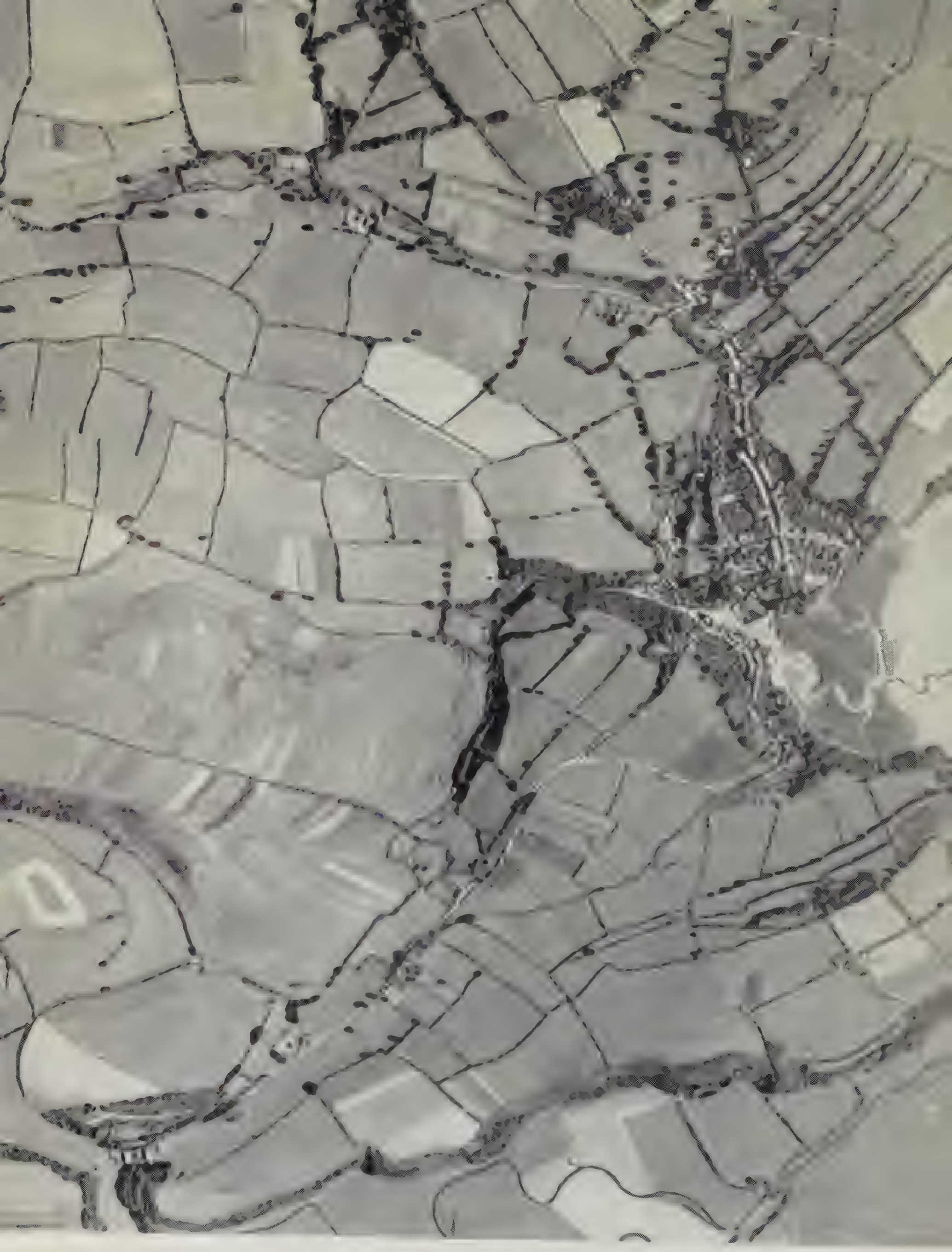


Plate I.—Laugharne, the Hugdon and the Lees, with north at the top of the photograph (see Fig. 1). The balks on the Hugdon can be seen, and north and northeast of it there is evidence that other balks between strips have been ploughed out. A better impression of the topography will be gained by turning the photograph so that the left-hand side becomes the bottom, i.e. by viewing from the west. (*Crown Copyright Reserved. Published by permission of the Air Ministry.*)

The Open Fields of Laugharne

MARGARET DAVIES

IN THE CENTURIES which followed the Norman conquest of South Wales, the English manorial system spread along the lowland margins of the Severn Sea and up the major valleys. Norman strategic points and, later, towns, were largely confined to plains and low plateaux fringing the pastoral highlands. Vestiges of open arable fields or of common meadows thus survive from the borders of Gloucestershire westwards into Pembrokeshire and northwards along the Cardiganshire coast. The largest open fields appear to have been those of south Monmouthshire. Here the parishes of Undy, Magor, Redwick and Caldicot had considerable areas of open arable and meadow land which were not enclosed until 1850–8.[1] Before the enclosure award of 1858, 225 acres of Caldicot parish lay in intermixed strips of arable and meadow. A survey of 1613 reveals considerable enclosures in the royal manor of Caldicot,[2] but its largest open arable area, the Great or West Field, was preserved until 1858. Smaller open fields are characteristic of Pembrokeshire, and here and in coastal Cardiganshire open fields in which strips owned by the bishops and clergy of St. Davids were intermixed existed in several manors in the mid-19th century.[3] There is a large open field at Llan-non in Cardiganshire. This Morfa Esgob (Bishop's coastland) was formerly minutely fragmented: light fences have recently been run along some of its balks. Small groups of strips were characteristic of the Gower peninsula of Glamorgan and open fields are still found at Rhosili. Throughout the low coast plateau of south Glamorgan (the Vale of Glamorgan) open fields lay around the nucleated villages which are so characteristic of the South Wales lowlands. The Vale "was a champyon and open country, without great store of inclosures; for in my time, old men reported, that they remembred in their youth, that Cattell in some time, for want of shade, to have from the Port Way runne to Barry, which is four miles distant."[4] Parts of the meadowlands of the Thaw valley, in the centre of the Vale, are still allotted in intermixed strips of ¼–1 acre and grazed in common. Many good Vale farms adjoin these meadows and the benefits of "ye length of the Knotgrasse growing on Lambethery morse"[5] are preferred to those of attested herds.

Large manors such as Lamphey in Pembrokeshire and Llantwit in Glamorgan formerly had extensive open fields.[6] Here the coast

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➤ Dr. Davies was formerly a lecturer in the Department of Geography, University of Manchester. This paper is part of a survey of the open fields of South Wales; other papers on Glamorgan and Monmouthshire examples are in the press elsewhere.

plateau surface is less frequently trenched by small valleys than that of Gower or south Carmarthenshire. Large areas of flat land are rare in South Wales and this factor, as well as the influence of Welsh tribal customs, on which Gray laid great emphasis,[7] appears to have modified a system which was better adapted to the plains of the English Midlands. A three-field system was rarely found in South Wales, but open fields, surviving in a few cases, and frequently fossilized in the field pattern were formerly widespread and were accompanied by English manorial customs and by the English open field terminology. Terms such as furlong, landshare, butt, gore, burgage and breach are found throughout anglicized South Wales.

South Carmarthenshire is a hilly area and for this, and for historical reasons, open fields were less widely developed than in other areas through which English custom spread westward. Yet it is there, at Laugharne, on the west side of the Tâf estuary, that open fields and their related features are best seen in continuous use since early in the 14th century. The lands then granted to the burgesses of Laugharne by Guy de Brian were much more extensive than those now held by them (Fig. 1). All the area north of Laugharne and the Hugdon was probably included in the original grant and appears to have been farmed in intermixed strips (Plate I). The charter granted a free common "from the rivulet which is called Macorells" northwards beyond the source of the Coran to points 2½ miles north of the Hugdon and one mile northwest of Whitehill Moor. When the boundaries are beaten every third year the 'Common Walk' encircles far more than the present open field boundaries. Much of the common pasture in Laugharne Marsh and the "free common in our whole North Wood of Coyde Bach" of the 14th century charter were appropriated by Sir John Perrot in 1574. Laugharne Corporation has a survey of the lordship, dated 2nd October, 1592, which totals free commons of only 400 acres. The area of the common land has not been much reduced since then. In 1842 Upper Moor, west of Whitehill Moor, was a 43-acre common; several smallholdings had already encroached upon it and it is now enclosed. Laugharne Corporation muniments provide no date for the initiation of the present system of allocation of common land. For many years it has been distributed in 76 shares which are held for life and not redistributed annually.

Three open fields survive: Whitehill Moor and the Hugdon are arable land, the Lees (Le Leaze under Clyff), on the northern limit of Laugharne Marsh, is largely pasture. The Lees lies below 100 feet and is bounded on the south side by the meanders of Railsgate Pill, known prior to the building of the quarry tramway as the Common Pill. The Lees is backed by the cliff face of Sir John's Hill, a ridge of Devonian red marls and sandstones. The rounded hump of the Hugdon and the enclosed lands east and west of Laugharne are

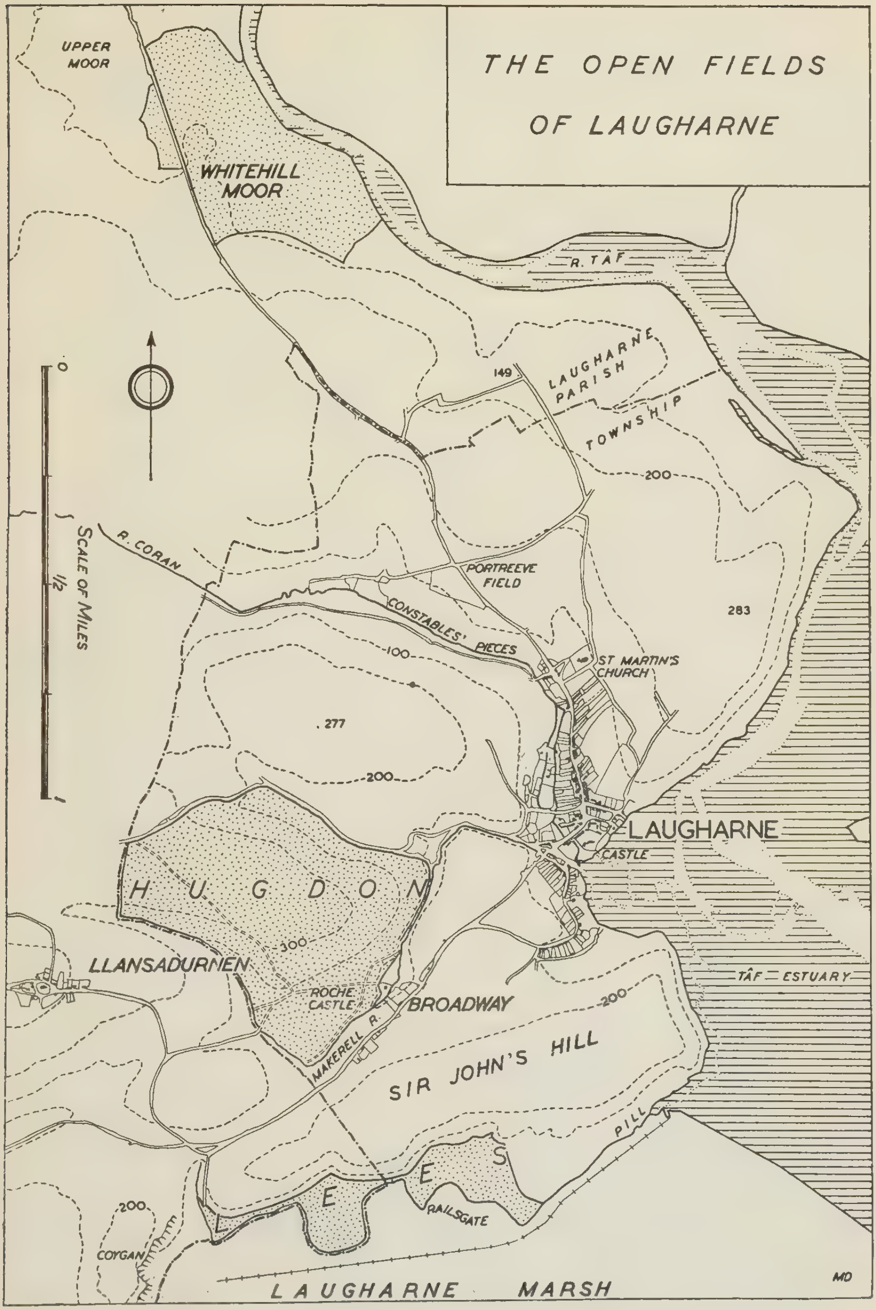

Fig. 1.—Laugharne and the three open fields (stippled). (*Based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown Copyright Reserved.*

underlain by similar Devonian rocks which weather into well-drained soils. Further north, Whitehill Moor has a drift cover underlain by Silurian (Llandeilo) shales. Its higher western margins are drift-free but soils are generally heavier than on the Hugdon. The flanks of the Hugdon are steep and at the east end the small strips are terraced into the hillside.

When the tithe award was made in 1842, the total area of the open fields of the Corporation of Laugharne was 311 acres, held in 274 strips. Comparison of the maps of the Hugdon and Lees (Figs. 2 and 4) and the air photograph (Plate I) reveals no boundary changes in the past century. A hedge has been made along the crest of the Hugdon and some of its smaller marginal strips have reverted to rough pasture. Whitehill Moor is unchanged. The Corporation also owns several smallholdings, cottages and fields, but these do not include the enclosed strips around St Martin's church on the north side of Laugharne.

In 1842, as now, the Corporation's open fields were divided into 76 shares and distributed among the burgesses in order of seniority in the burgess roll as the shares became vacant on the death of a burgess. Burgesses are householders, sons or sons-in-law of burgesses who have resided in the township of Laugharne or in the adjoining parish of Llansadurnen for twelve months before the presentation of their share. Nominal rents of sixpence (Lees), a shilling (Hugdon) and two shillings (Whitehill Moor) are paid by the burgesses to the Corporation for their shares. Burgesses who do not farm their shares nowadays rent them at from £4 to £10 per annum. The 76 shares are allocated as follows: Lees, 40; Hugdon, 20; and Whitehill Moor, 16. The table and Figs. 2–4 show the shares and strips* of each burgess in 1842. Each share on the Hugdon averaged 7–9 acres, made up of 5–12 strips. The shares include a large strip of three to four acres which runs up and over the top of the ridge (Fig. 2). Marginal strips are fairly allocated in relation to gradient and aspect. The sixteen shares on Whitehill Moor mostly run smoothly upslope from the river Tâf and each may be from nearly 5 to over 10 acres held, typically, in three strips placed in different parts of the 100 acres of arable land (Fig. 3). These gently sloping and relatively wide strips, often of 2–3 acres each, make up the shares rented at twice those of the Hugdon. The eastern half of the 39½ acres on the Lees lies in the township of Laugharne and here there are 20 shares, normally of ½–2 acres, made up of 1–5 strips of pasture. The western, drier half of the Lees lies in the parish of Llansadurnen and here, in 1842, 19 burgesses each held one arable strip and one share (9) was in two strips. The acreages of these 20 shares are given on Fig. 4 and they have been omitted from the table.

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* The areas of strips are shown in acres, roods and perches in Table I and Figs. 2–4.

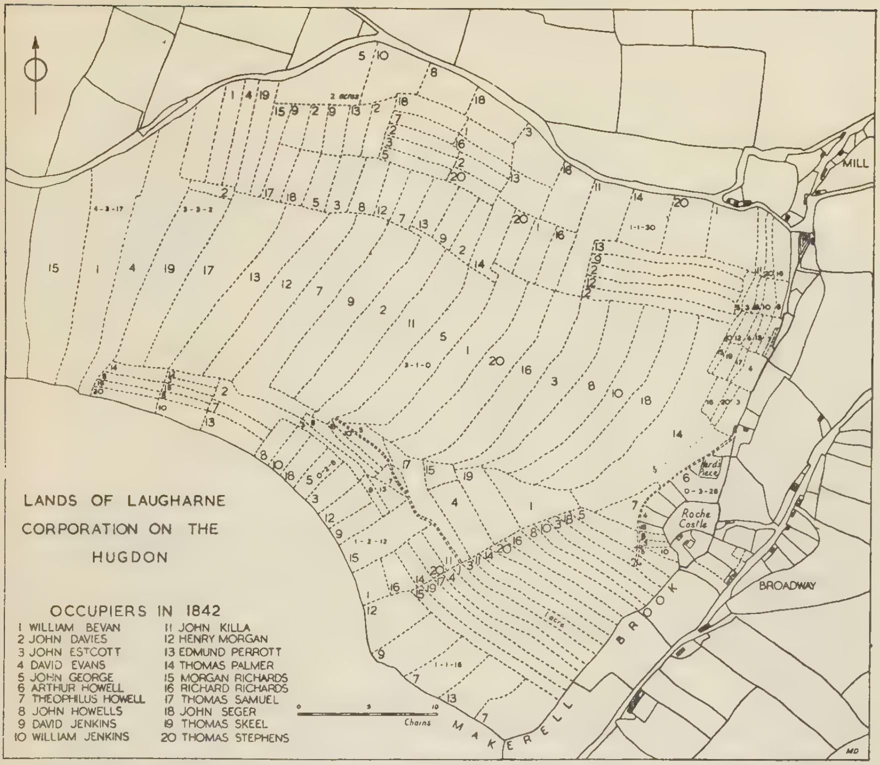

Fig. 2.—The Hugdon, 1842. The one-acre strip left blank on the northwest of the Hugdon was wrongly entered by the tithe commissioners as privately owned and occupied by a man whose name is not included in the list of shareholders. Two small enclosed strips adjoining Roche Castle were excluded from the shares.

An account of Laugharne published in 1835 notes that "some hold two or more shares as tenants of others."[8] Table 1, based on tithe apportionments, bears this out: 76 shares are listed but the names of "occupiers" total only 67. Eight burgesses occupied a share in one of the arable fields and a second share of pasture on the Lees. Only William Bevan held shares in each of the three fields and he also appears to have farmed most of the share of Arthur Howell on the Hugdon. Share 11 on Whitehill Moor is also enlarged at the expense of other shareholders. There is obviously no attempt to distribute holdings over the three open fields or even over the two areas of arable on the Hugdon and Whitehill Moor. The greater convenience of the grouping of arable strips in one field has facilitated the continued survival of the system at Laugharne and the allocation of the strips which make up a share, whether on arable or pasture, is finely and fairly adjusted. The distribution of strips on the Hugdon, for example, is well balanced in respect of area, gradient and aspect, as was the intention of medieval distribution. Co-operation in 1842 was naturally not that of the medieval manor. The poorer shareholders, who might be labourers

Table I

THE SHARES OF THE BURGESSES OF LAUGHARNE, 1842

Burgesses	Hugdon[1]		Whitehill Moor		Lees[2]	
	Acreage of Share	*No. of Strips*	*Acreage of Share*	*No. of Strips*	*Acreage of Share*	*No. of Strips*
	a. r. p.[3]		a. r. p.		a. r. p.	
Robert Bevan					0 2 28	1
William Bevan	15 2 7	9	5 0 20	3	0 2 35	2
Thomas Beynon			5 1 39	4		
William Beynon					1 0 4	1
John Davies	9 1 0	10			0 3 14	3
John Estcott	9 3 7	12				
Thomas Estcott			6 1 31	4		
David Evans	8 3 9	7				
John George	8 2 7	8				
Walter Griffiths			5 2 5	3		
Thomas Harry			4 3 19	3		
Elizabeth Hitchings					0 1 38	5
Arthur Howell	0 3 28	1			1 2 15	3
David Howell					2 3 26	2
Daniel Howell			6 2 20	3		
George Howell			4 3 24	3		
Theophilus Howell	9 3 12	10			0 3 21	1
John Howells	7 2 21	10				
Richard Howells					1 3 20	3
David Hugh			6 1 36	4		
David Jenkins	8 2 39	8			1 3 6	2
John Jenkins			5 1 37	3	0 2 5	3
William Jenkins	7 1 31	9				
Thomas John			6 0 26	2		
Walter John			10 1 8	6		
John Jones			7 3 13	3		
Joseph Jones			4 3 28	3		
Thomas Jones					1 1 19	3
John Killa	7 1 24	5				
Benjamin Morgan			6 2 34	3		
Henry Morgan	7 1 13	7				
David Morris					1 1 31	5
James Morris					0 3 20	1
Richard Morris					1 0 15	3
William Morris					0 3 39	4
Edmund Perrott	9 0 18	9				
Thomas Palmer	9 3 8	6				
John Richards			6 1 37	3	1 0 35	3
Morgan Richards	9 0 34	6				
Richard Richards	8 1 39	9				
Thomas Samuel	7 2 27	5				
John Seger	8 0 24	10				
Thomas Skeel	7 2 18	5				
Thomas Stephens	8 1 27	9				
John Thomas			6 1 30	3	1 0 8	1
Henry Wilkins					1 0 8	4
Thomas Wood					0 3 37	1
Totals	171 2 28	149	99 1 33	53	22 3 30	51

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[1] 1 a. 0 r. 35 p. and one strip should be added to the Hugdon totals (see Fig. 2).

[2] On the Llansadurnen half of the Lees there are 20 shares in 21 strips with a total acreage of 16 a. 3 r. 5 p. (see Fig. 4).

[3] 1 acre (·40468 hectare) = 4 roods; 1 rood = 40 perches.

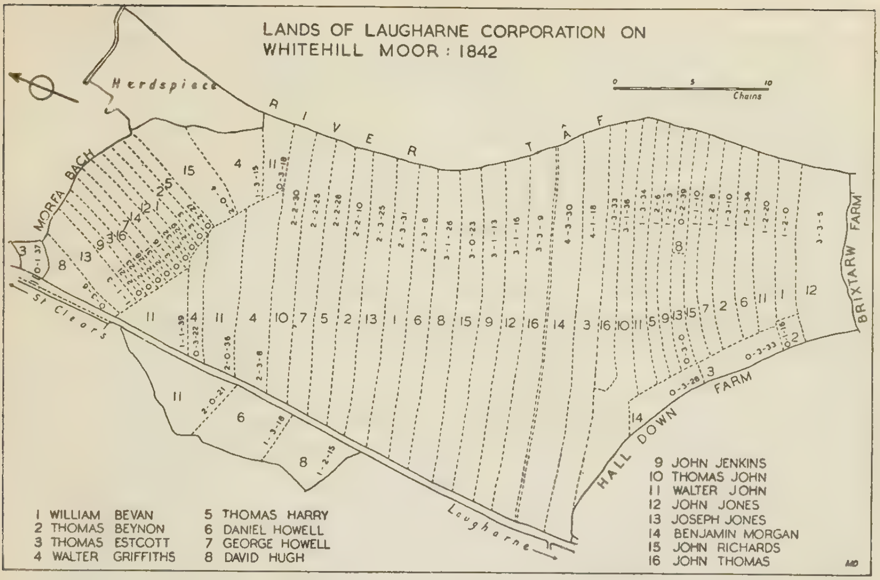

Fig. 3.—Whitehill Moor, 1842. Enclosed pieces allocated to officials of the Corporation, e.g. Herdspiece, are scattered throughout the arable lands around Laugharne (see also Fig. 1).

living in cottages built on roadside waste pieces on the periphery of the open fields, or burgesses involved in Laugharne's minor port activities, often had their strips ploughed, sown and harvested by a neighbour who might also thresh the crop. For these services he would usually be paid half the produce of the share. On the death of a burgess his personal representative would take over until the next

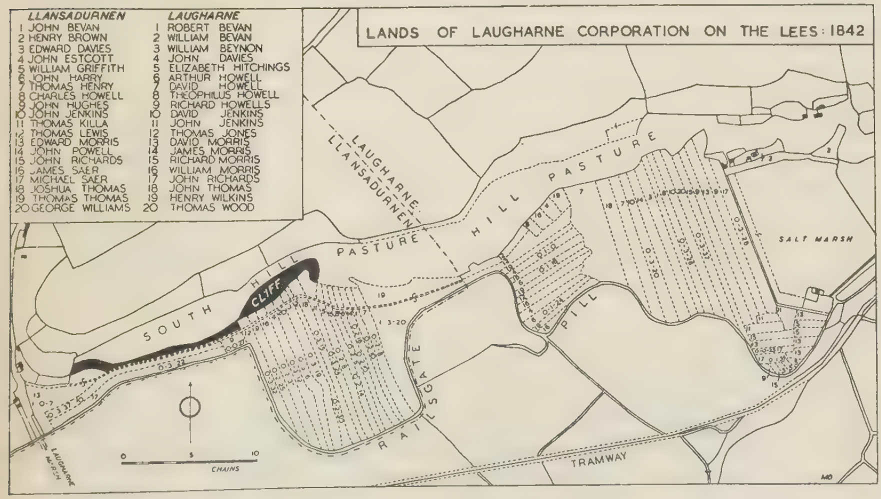

Fig. 4.—The Lees, 1842.

Michaelmas court. This may explain why the tithe commissioners listed a woman as occupier of share 5 on the Laugharne half of the Lees.

The flat Lees is ridged and ditched to facilitate drainage into Railsgate Pill, but at the present day some of the boundaries of the minute subdivisions indicated on Fig. 4 cannot be seen on the ground. It is the only open field in South Wales known to the writer to lie in ridge and furrow. Strips on the Hugdon and Whitehill Moor are separated by low grass-grown balks known locally as *landscars* or *landskers* which must not be cut by the plough. Lawnsheds is the equivalent in the Isle of Portland.[9] At Rhosili landshare is used and it survives in the field names of Gower and Pembrokeshire. The balks increase in height as they run downhill into the valley margins of the Hugdon and here an occasional bush or sapling may be found on them. On the steep slopes of the Hugdon the balks form linchets which may now carry a small amount of scrub. Grassy balks are found between strips in the surviving open arable fields of Gower and Cardiganshire. These are underlain by limestone and raised beach deposits respectively and support the view that balks are usually associated with light soils.[10] Ridge and furrow cannot be correlated with open fields in South Wales where large enclosed estates were being ridged by enthusiastic improvers well into the 19th century.

In the early 19th century the Laugharne strips were in corn for three years, followed by three years in grass, but there is now no restriction on cropping. The arable fields are, however, thrown open to cattle for two winter months, usually November and December, and cattle are stinted according to the acreages of the shares. Light fences are then thrown round corn stacks placed at the ends of some strips, but no other fencing is permitted. At Rhosili stock no longer graze in the open fields (Rhosili Big and Little Vile). These lie on the smooth surface of a peninsula lifted high on limestone cliffs above the Bristol Channel. Spring cabbage and early potatoes are found on many strips; this southwesterly snout of Gower has been drawn into its expanding production of early vegetables. The Laugharne area is also relatively mild but winter grazing of the open arable fields naturally precludes cultivation of such crops as spring cabbage. Both Rhosili Vile and the Hugdon are swept by strong winds and hedges would appear to be desirable for shelter. But local farmers rightly argue that harvest winds sweeping evenly over the open fields dry the corn better. The low balks also occupy much narrower strips of land than hedges.

The strips in the open fields of Laugharne are not redistributed annually[11] but their intermixture and fragmentation are medieval features. Well farmed, with the use of modern techniques, the remnants of the common fields, "this lasting memorial of Sir Guy Brian's judicious bounty," survive at Laugharne with the arable "yearly crowned with the golden honours of Ceres."[12]

REFERENCES

[1] These four parishes are included in the distribution map in the first edition of C. S. and C. S. Orwin, *The Open Fields*, Oxford, 1938, p. 65, as the only examples in Wales and Monmouthshire.

[2] William Rees, *A Survey of the Duchy of Lancaster Lordships in Wales, 1609–13*, Cardiff, 1953, pp. 135 ff.

[3] John Clark, *Report to the Bishop of St. Davids, June 20th 1802*, notes that no bishop would pay his portion of the enormous expense of obtaining an act for enclosing the 30,000 acres of common or waste land in the diocese as he would no longer be bishop when enclosure was completed.

[4] Rice Merrick, *A Booke of Glamorganshire's Antiquities, 1578*. Ed. J. A. Corbett, London, 1887, p. 10.

[5] Edward Lhwyd, *Parochialia*. Ed. R. H. Morris, part iii, *Arch. Camb. Suppl.*, London, 1911, p. 23.

[6] William Rees, *South Wales and the March*, Oxford, 1924, pp. 140–1. This work provides full documentary evidence for the wide distribution of open fields in South Wales and the border counties.

[7] H. L. Gray, *English Field Systems*, Cambridge, Mass., 1915.

[8] *First Report of the Commissioners to Inquire into the Municipal Corporations*, London, 1835, *Appendix I*, p. 289.

[9] C. H. Drew, *Antiquity*, vol. xxii, p. 79. In Pembrokeshire the line between areas of predominantly Welsh and mainly English speech is known as the landsker.

[10] Eric Kerridge, *Economic History Review*, 2nd series, vol. iv, 1951, p. 19, and *Agricultural History Review*, vol. iii, 1955, pp. 26–40.

[11] It is doubtful whether annual redistributions of arable strips were a feature of medieval farming. See Maurice Beresford, *The Lost Villages of England*, London, 1954, p. 46. Meadow strips were re-allocated by rota in the Vale of Glamorgan in the 17th century.

[12] A. J. Kemp, *Gentleman's Magazine*, 1839, p. 359.

A Sample Study of Land Use in the Nile Delta

NASR EL-SAYED NASR

THIS PAPER gives the results of an investigation into the agricultural geography of part of the Nile Delta. The investigation took the form, first, of a detailed land-use survey in the field during the winter and spring of the 1950–1 agricultural year and, second, of the subsequent cartographical analysis of data collected during the course of that survey. The mapping of the entire Delta was too vast a task single-handed and the minuteness of the plots and of the holdings made for slower progress than in Britain with its larger fields and its larger farms. Moreover a land-use survey of the Nile Delta presents problems different from those of a land-use survey of Britain not only in scale but also in kind. The whole area is in arable cultivation so that mapping, if areal differentiation is to be attempted, must be of individual crops. Further, two crops a year on the same plot are the rule and there could be a single land-use map for a particular year only if it could record this double cropping. Attention was, therefore, concentrated on a single markaz,* that of Ashmoun, lying at the head of the Delta 20 kilometres downstream from Cairo. It comprises 67,971 feddans (or 70,553 acres) and includes the farm lands of 48 villages. Although the conclusions here presented refer to Ashmoun alone, Ashmoun itself is not unrepresentative of the larger area, the Nile Delta, of which it forms a part.

The terrain of Ashmoun is that of flat deltaic country sloping gently seawards (Fig. 1). The Damietta branch of the Nile forms its eastern boundary, separating Ashmoun from cultivated land of the eastern Delta; the Rosetta branch forms its western boundary, separating it from the desert. These two distributaries have built up their banks and the land surface slopes away from them to a long irregular hollow in the centre of the markaz. Air photographs show the former existence of swinging channels, now marked by a different pattern of fields, in the midst of cultivated land.

These relief features, though insufficiently marked to be seen in the field, determine the framework of the irrigation system which carries

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➤ Dr. Nasr conducted the investigation on which this paper is based while he was a post-graduate student in the Department of Geography of the University of Liverpool. He is indebted to Professor Wilfred Smith of that department for assistance in drafting the paper and to Professor L. Dudley Stamp for reading and commenting upon it.

* A markaz is a sub-division of a province. The Nile Delta has seven provinces and forty-two marakez.

the waters of the Nile to the fields and without which systematic and continuous agricultural production would be impossible. The main irrigation channels (Fig. 1), with an intake from the Nile, keep to the inner flanks of the high ground and the branch canals and distributaries lead from the main canals to carry water down slope. Not all the canals and distributaries are aligned efficiently: some have inadequate outfalls to dispose of surplus water, some have "crossings" of other irrigation and drainage channels. The Punjab canals similarly follow the higher ground. The main and branch canals have water in them the year round, except when closed for cleaning during the winter (December to February), but little direct irrigation from them is permitted. The distributaries carry water only during their turn in the rotation and from them water passes into the farmers' own canals which lead directly into the fields. In the *nili* season, when the Nile is in flood, water passes on to the land by means of flush irrigation without the use of contrivances to lift water on to the fields; but in the low-water seasons a lift is essential. Methods of water-lift are varied, ranging from the traditional *shadouf* to the centrifugal pump, and from the *tambour* (Archimedean screw) which will lift to heights of less than a metre to the *sakia* (water-wheel) which will lift to heights of up to eight metres.* Irrigation waters cannot, however, be taken to all fields and on the highest areas near the banks of the Damietta and Rosetta branches well irrigation is necessary. Well irrigation is also the rule with *gezira*† land, within the river bank and thus outside the system of canal irrigation. This is more expensive than canal irrigation and it is the larger rather than the smaller farmers who practise it, particularly since centrifugal pumps have become common.

In order that canal irrigation water shall be fairly distributed and economically employed, rotation systems (Fig. 3‡) have been devised on the general principle of one irrigation turn, of five days or thereabouts, and two stopping turns, except that in spring one of the stopping turns may be an additional irrigation turn but of low intensity. The length of the turns can be adjusted according to the volume of water available. The amount of water required by different crops varies, rice requiring more than cotton, cotton more than wheat. In Ashmoun rice is forbidden on land dependent on canal irrigation and it can only be grown on land irrigated from wells. Rice requires more frequent watering than any other crop (four days irrigation turn and four days stopping turn alternately) and it is difficult to fit it into a regional irrigation rotation system which, serving a wide range of crops, needs less water. It is well known that perennial irrigation frequently repeated is causing soil deterioration, a condition absent under basin irrigation. Such soil deterioration is particularly severe in rice fields. The treatment is drainage by open or covered drains in order to lower the water-table, despite the known difficulties of piecemeal drainage of land held in such small parcels and with such low gradients. The main drains to take off surplus water are shown in Fig. 2.

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* A detailed study of the distribution of these contrivances has been made in relation to topographical conditions, and therefore the height of lift required, and in relation to size of holding, and therefore the quantities of water required and the capital equipment of the farmer. In *gezira* land either a centrifugal pump or the *sakia* must be employed: the *tambour* would be useless. A large farmer has centrifugal pumps which a small farmer could not afford: a medium-sized farm would have the *sakia* but a small farmer would have to share such a water-wheel with others. The *tambour* is the small man's implement. There is, in fact, duplication of equipment especially among the small holders and much equipment that can be used only to a small fraction of its capacity.

† As defined later.

‡ The word "dors" in the caption is an English plural of a transcribed Arabic word meaning "turn" or "period," viz. *dor* (pl. *adwar*).

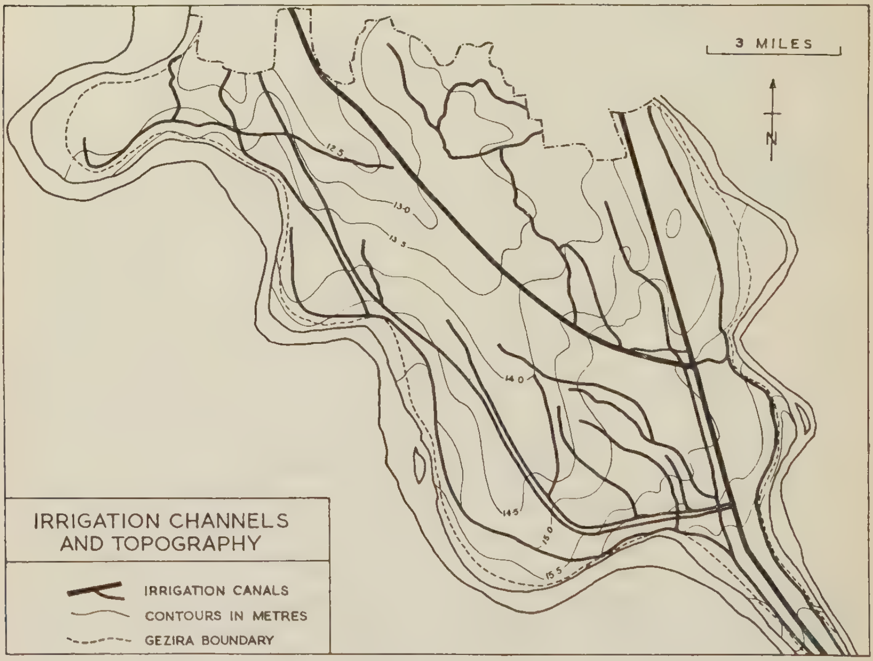

Fig. 1.

During the field survey 211 samples of the farmer's surface soil were taken. They were evenly dispersed over the markaz (one for each sheet on the scale of 1 : 2,500) and were selected as representative of their immediate locality in so far as this could be determined by inspection. Particulars of cropping and estimates of workability were obtained from farmers for each sample. These samples have been analysed mechanically, but not as yet chemically. Successive investigators of Egyptian soils have come to the conclusion that the chemical composition of the soil is less significant in the determination of crop yield than its physical properties. The general run of Egyptian soils have (a) sufficient potash, which is more than enough for cotton, (b) a phosphate content which is declining, particularly in the sub-soil,

(c) a shortage of nitrogen. Their chief manurial requirements are organic manure to furnish nitrogen and superphosphate to arrest the phosphatic depletion. Before discussing the results of the mechanical analysis of the soil samples, it may be useful to record the soil types as known to the practising farmer in Ashmoun:

(1) the light sandy soils, *ard ramllia*, thirsty, easy to work, giving poor yields;

(2) the yellow soils, *ard safra*, also light and easy to work, but requiring less water than the sands;

(3) the black soils, *ard soda*, heavy dark soils, difficult to work and drain but productive;

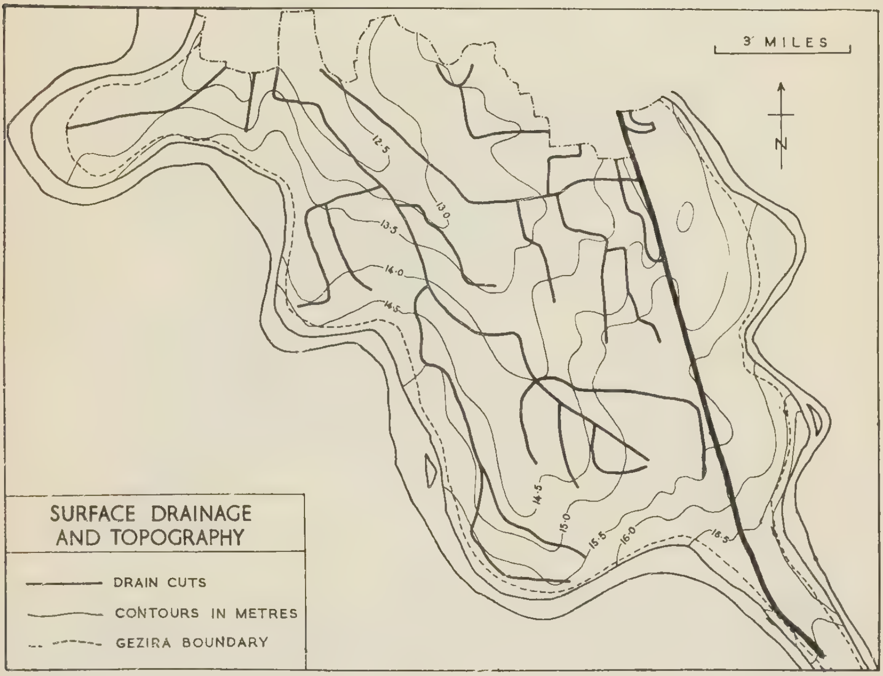

Fig. 2.

(4) inferior soils, easily waterlogged and subject to deposition of salts.

This classification may be subjective, but it is employed administratively as a basis for taxation. The mechanical analysis of the samples was carried out in the soil laboratory of the Faculty of Agriculture, University of Cairo, under the supervision of Dr. A. Zein d-Abdin. I experimented with several classifications on the basis of the equilateral triangle method but none proved to be wholly satisfactory.* I also mapped the percentage of different fractions and, of these maps, that showing the percentage of coarse material is reproduced here* (Fig. 4). The soils with high percentages of fine material lie in the centre of the markaz, the finest being on the whole in the lowest areas. These are the soils which the farmer favours, being naturally most fertile unless waterlogged. Moreover, they are not unrelated to the highest land values. The light sands form an almost continuous aureole,† lying on the higher ground next to the river and in addition constituting the land within the river banks exposed at low water. They are lightest of all in the west facing the desert. The exposures of river sand form a highly individualized landscape described as *gezira*, i.e., an island, for some examples are literally islands joined to the mainland only at very low water. *Gezira* soil is light and generally free-draining, it is poor in plant nutrients and it is not capable of growing the staple crops of the Ashmoun farmer. It is more suited to a different cropping system altogether. It is usually assessed at lower land values for taxation purposes than the finer soils. It is generally held by large landowners and is then involved in capitalist and not subsistence farming. The distinction is fundamental and will be returned to later.

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* I am indebted to Dr. G. V. Jacks and Dr. D. A. Osmond of Rothamsted Experimental Station for their kindness in discussing problems of classification with me. For an exposition of the equilateral triangle method see Circular 419 (1927) of the U.S.A. Department of Agriculture and the paper by T. J. Marshall published in 1947 by the Australian Council of Industrial and Scientific Research.

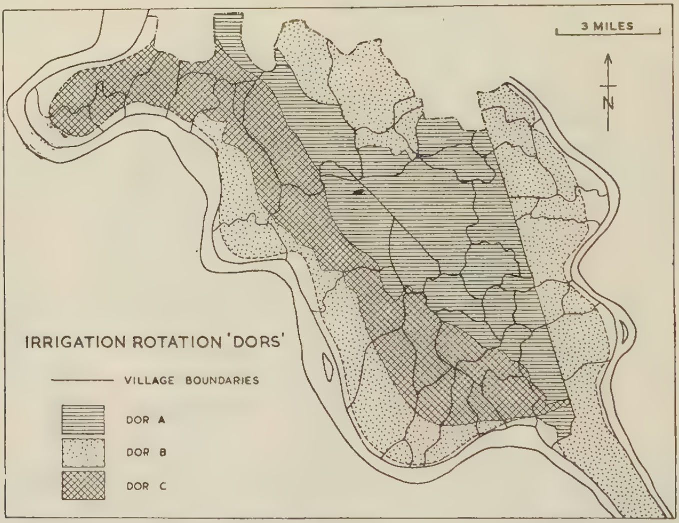

Fig. 3.

The seasonal rhythm of the delta climate is such that more than one crop can be taken per year provided that adequate water is available. When basin irrigation during the Nile flood was the practice, there was a single crop a year; but perennial irrigation, as a result of the storage of flood waters for gradual dispersal in irrigation rotations during spring and summer, made possible the present practice of multi-cropping. The mean air temperature of each month is above 10° C. or 42° F. and on this evidence plant growth is possible the year through, but night temperatures and particularly grass minimum temperatures fall below this level. The farmer is familiar with devices of keeping a winter crop "warm"; a straw cover, a nurse crop, a smoke blanket. The agricultural year may be divided into three overlapping seasons; *shitwi*, from November to June, *sefi*, from February to October, *nili*, from July to October. The crops proper to these seasons are wheat and clover, cotton, and *nili* maize respectively, but the cotton and maize are alternatives and are never grown in succession on the same land in the same year. The agricultural calendar (Fig. 5) shows with perfect clarity that in the year in which cotton is grown only clover can precede it, but that in the year in which *nili* maize is grown it can be preceded by wheat or barley. The common rotation by small farmers on average land, excluding *gezira* land and land with salty soils, is thus as follows; first year, clover followed by cotton; second year, wheat followed by *nili* maize; third year, clover and beans followed by *nili* maize. In some districts of high farming, such as Sintris, the rotation is shortened to a two-year, in which the first year is as above and the second year has maize preceded by clover on half the area and by wheat on the other half. On salty soils the normal three-year rotation is followed, except that rice follows wheat in the second year instead of maize. Where cotton is grown on *gezira* land, it is not grown oftener than every fourth year.

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* The coarse material was taken to be that with particle size above 0·02 mm.

† There are, however, some sandy patches towards the centre of the markaz, due perhaps (as these are samples) to the application of sand in cotton cultivation year after year.

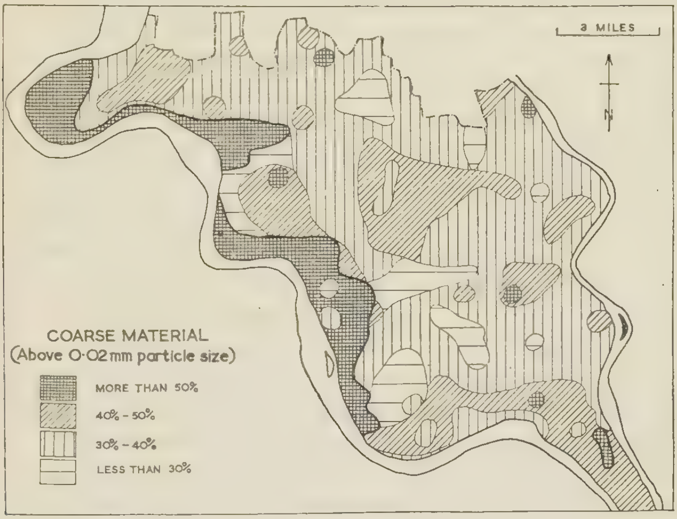

Fig. 4.

The systems of farming by the small peasant and by the large landowner are sharply contrasted. The small man has scarcely enough, usually less than enough, land to support his family even if he were to grow subsistence crops alone. Nevertheless, he must grow some cash crops to provide rent and to purchase clothing, implements and fertilizers. He is compelled to practise the strictest economy, returning all manurial residues to the soil and cultivating it intensively by hand methods. He is tempted to overcrop and to allow the land insufficient rest. His methods are possible only on the richer soils and even these are suffering: his methods could not be practised on *gezira* land. The small peasant's holding is fragmented and dispersed and it leads to considerable waste of time and effort. Some consolidation is possible and is sometimes effected, but land hunger is such that any piece of land is taken up within the village whether contiguous to land already farmed or not.* The large landowner farms his land much less for subsistence cropping and much more for cash cropping. Subsistence crops are grown but mostly for hired labourers in lieu of part of their wages. He has no difficulty in hiring the labour he requires, for that large class of peasantry which has holdings too small for subsistence must needs supplement its resources by working for wages. He has not the same desperate need to squeeze the last ounce of food out of his land, and, being less concerned with maize as a subsistence crop and with clover as a fodder crop, he is more ready to substitute fallow for either or both of these. The large landowner farms both the better clay loams and loams and the poorer sandy soils, but he has in his possession a greater proportion of the latter. Much of *gezira* land farming is in fact large-scale capitalist farming. There are thus two main types of farming in Ashmoun, though the differences between them are not absolute, on the loams and clay loams and on the sands respectively. These differ both in soil and in crops, in objective and in management. There is a somewhat parallel difference in form of settlement. In the main body of the area settlement is nucleated, an agglomeration of houses belonging to small farmers all huddled together for defence and safety and often on mounds raised higher by the debris of ancient habitation sites. But in the *gezira* the settlement form is the large farm, *ezba*, which may contain as many as seventy houses, labourers' houses grouped together with the landlord's house and the farm buildings. This also is a defence unit.

The normal or standard agricultural system in Ashmoun is wheat and clover as winter crops and cotton and maize as summer and *nili* crops. They are the most satisfactory crops in respect both of suitability to soil and of value within the particular physical and economic context of the markaz. But they are sensitive to particular physical conditions and where these are absent the crop either fails or gives low yields and the land is withdrawn from the normal system and put under other crops. The particular physical conditions are, first, a free-draining silt or clay loam, and, second, a low percentage of soluble salts and an absence of drainage impedance. The heavier soils are inherently more fertile than the lighter and they are preferred for arable crops. It is true that cultivation costs are greater on heavy than on light soils, but irrigation costs are less.* Relative labour costs of this kind, however, are no more important in modern Egypt than they were in medieval England. A light soil under Egyptian conditions is peculiarly hungry both for plant food and for water and most light soils in Ashmoun are badly placed for canal irrigation. Light soils are thus withdrawn from normal cropping. The crops of this system, moreover, are sensitive to a high percentage of soluble salts. Maize is the most sensitive of all. A high percentage of soluble salts is a result of drainage impedance and drainage impedance a consequence of low relief. Under such conditions barley may be substituted for wheat and clover, and rice for cotton and maize. Within the area where suitable

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* There are some superficial similarities with medieval Britain, but there is no real comparability. The dispersal of plots is less in modern Egypt, the common cultivation is absent and the social structure is different. For additional information see "Land and the Egyptian Peasant" on pp. 194–6 of this issue.

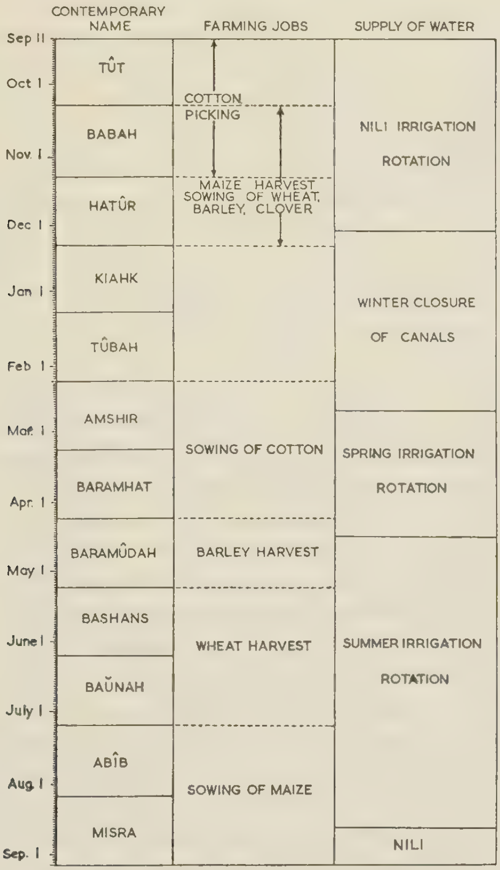

Fig. 5.—The agricultural calendar.

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* For wheat, three waterings are required for heavy as compared with four for light soils.

physical conditions are present, there are considerable variations in yield, due to differences of soil productivity and of farming efficiency. It is well known in the markaz that farmers are more efficient in some villages than in others.

Wheat, as in England, is winter-sown (Fig. 6). It follows either maize or cotton of the preceding crop-year: it is the best practice to follow cotton for that allows more time for cultivation preparatory to sowing. It must be sown sufficiently early to enable the young wheat plants to have their second watering before the winter closure of canals. Date of sowing is thus rigidly controlled, unless, indeed, wheat follows fallow. The third watering succeeds the re-opening of canals and where a fourth is necessary, as on light soils, it follows a month later. By this time the green growth stage of the plant is completed and the rest of its life-cycle consists of the formation of the ear and the ripening of the grain. This requires little or no water. Wheat is widely dispersed over Ashmoun, for subsequent to 1941 all holders were required to put under wheat a certain percentage of their acreage (excluding that under fruit and vegetables), the percentage varying from time to time and from one part of Egypt to another. Apart from such government decree, the very small holders would rather grow clover than wheat for their winter crop as clover is animal feed and wheat is consumed on the farm only on special festive occasions. Clover also is winter-sown and it also follows maize or cotton of the preceding crop-year. If following cotton, clover at times may be sown on the cotton ridges while the cotton plant is still standing and, if following maize, it is usually sown before maize receives its last watering, maize being harvested sometimes scarcely before clover is ready for its first cutting. Clover remains in the ground until cultivations preparatory to the following crop are ready to begin. When cotton follows then it is possible to get only one or two cuts for fodder before the sward is turned under to act as a green manure for the cotton crop. When maize follows, it may remain in the ground longer until the maize cultivations are ready to begin and in these circumstances four or five cuts may be taken. Alternatively, the clover may be grazed by tethered beasts and rotational grazing is then practised, the land being irrigated and rested after each period of grazing. The interval between each cut and each grazing is approximately forty days. The clover crop thus serves two indispensable functions, that of feeding working stock and milking stock and that of manuring the ground for the exhaustive summer crops which follow it. These needs are felt more strongly by the small than by the large farmer and clover is widely dispersed in small plots over the whole of Ashmoun.

Maize is the chief bread corn consumed on the farm, wheat being sold for town consumption. Moreover, the thinnings of the maize field are fed to stock, there being no clover during the summer. But the large farmer is interested in the crop to only a limited extent and

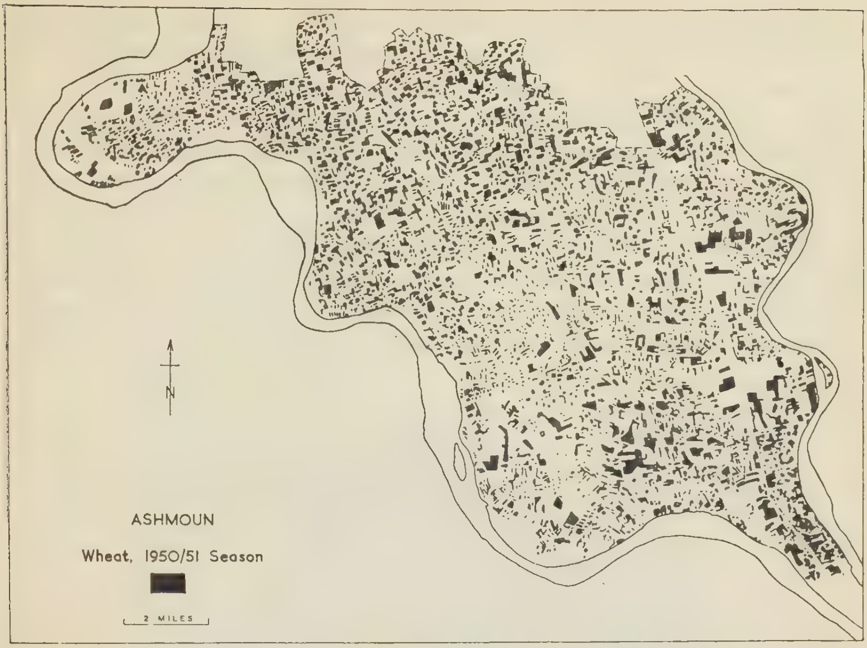

Fig. 6.

is far more concerned with crops for sale. *Nili* maize follows a winter crop, wheat, clover or beans. Wheat and beans have been harvested already and a short period of fallow is usually possible before cultivations begin. There is a temptation to harvest a catch crop of vegetables, but the maize crop suffers. The highest maize yields follow clover and the lowest follow wheat. As the chief bread corn, maize gets nearly all the farmyard manure which rots quickly during the height of summer. The clays are the most productive maize lands and these are watered six to eight times during the growing season, much more frequently than for wheat. The sands in Ashmoun grow no *nili* maize at all. After cutting, the maize crop is stored on the house roof and the stalk is used for fuel. The only trade in maize is with the nearest village. Cotton, in contrast, is the cash crop and is sold wholly out of Ashmoun. It is a crop of the small as well as of the large farmer, excepting only those men who have less than one feddan, that is, those who are part-time farmers and whose main income is derived from other sources than working their own land. Cotton pays the rent, it provides money for clothes and October, the chief harvesting month for cotton, is likewise the main month for marriages. But, although bringing in the chief cash return, it demands much more labour and care than any other crop. Cotton requires a rich soil and is a failure on poor sandy land. It requires deep cultivation and the thorough preparation of a fine tilth. The soil is then thrown into ridges running E.-W. and the seeds are sown or, more accurately, dibbled in by hand on the southern side of the ridge in order to obtain the maximum warmth for the young cotton seedlings, particularly for the early sown. The crop receives some eight to ten waterings at 12-day intervals and to facilitate irrigation the cotton plot is divided into basins. The manuring of cotton is mainly nitrogenous and is applied in the form of nitrate of soda, by preference directly to the plant itself. Farmyard manure is sometimes applied but cotton is not as gross a feeder as maize and the maize crop has the first choice of such organic manure. Phosphates and potash have variable results and only under certain limited conditions do they increase yield. Quite extensive experiments have been carried out on the response of the cotton crop to quantity and kind of manuring and to timing of irrigation. There have also been experiments on the varieties most suitable for Egyptian conditions and it is clear that they vary as between the Delta and Upper Egypt.

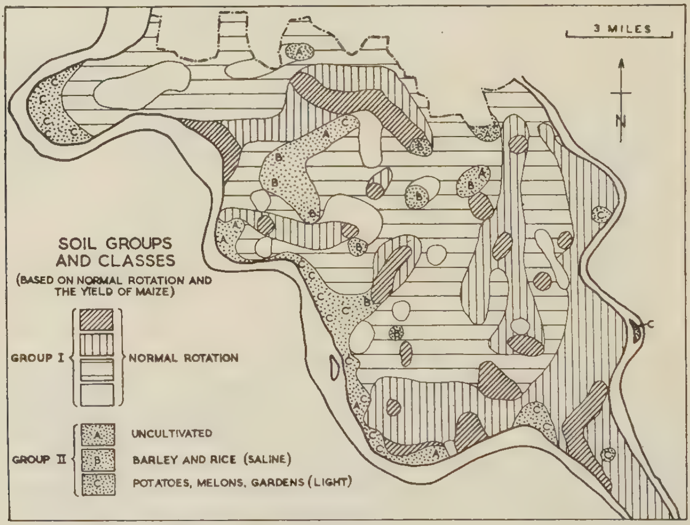
3 MILES
N
SOIL GROUPS AND CLASSES
(BASED ON NORMAL ROTATION AND THE YIELD OF MAIZE)
GROUP I
NORMAL ROTATION
GROUP II
A UNCULTIVATED
B BARLEY AND RICE (SALINE)
C POTATOES, MELONS, GARDENS (LIGHT)
A
B
C

Fig. 7.

The main differences in nature of soil and of management between the silt loams and clay loams on the one hand and the sandy land on the other have already been indicated. The sandy soils are employed mainly for vegetable crops and for fruit trees. The employment of sandy soils for growing vegetables is common to other lands as well as Egypt: they are easy to cultivate by hand methods, they are suitable vehicles for the heavy manuring which is essential in any case for profitable vegetable production, they facilitate the penetration of water and warmth into the soil and encourage the rapid growth and early maturity of the vegetable crop. Moreover, the differing water requirements of varied vegetable cropping necessitate well irrigation and, while well irrigation can be practised anywhere, it is for reasons indicated earlier a feature associated with the *gezira* and with the high ground adjacent to it. In Britain production of vegetables for sale is a small holding business even more than a large farm business, but in Ashmoun it is almost entirely the business of the large farm and is for the Cairo market. Small farmers have short strips of vegetables for their own consumption but not for sale.

Potatoes thrive best and give the heaviest yields on *gezira* land. Although they can be grown in each of the three seasons, the summer gives the heaviest yields both in yield per feddan and, even more, in yield relative to seed sown. Two crops per year are sometimes got from the same land and potatoes are sometimes grown continuously year after year in the same ground: this inevitably means declining yields.

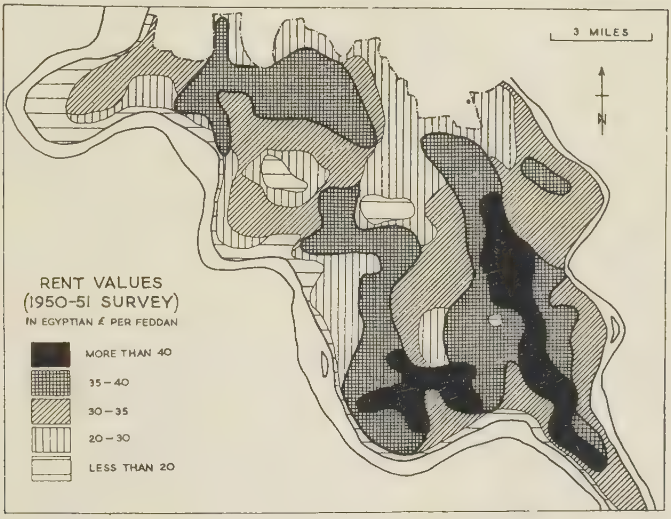

Fig. 8.

The summer potato crop may yield up to 8–10 tons per feddan, which would be regarded as a good crop under British conditions. In order to get these yields on light land ten to a dozen waterings are needed. Tomatoes can also be grown at any season of the year, provided that in winter they are covered with straw or leaves to keep the plants warm. The summer crop, picked between May and August, gives the highest yields. The manuring of the crop is comparable to that for potatoes. Plants are transplanted from a nursery to the south side of ridges in winter and to the north side in summer, for young tomato plants wilt in the sun. Watering of tomatoes has, of course, to be very carefully controlled, especially when the fruit is ripening. Fruit will begin to ripen after three to five months and plants will then bear fruit for one and a half to two and a half months. On the lowest *gezira* when exposed during the low-water levels immediately prior to the floods of the *nili* season, there is a fringe of water-melon plots bordering the waters of the river, every farmer who holds a plot of land adjacent to the Nile having the right to cultivate for this purpose that part of the *gezira* which forms a continuation of his plot. The water-melon crop is manured with pigeon dung if obtainable and with farmyard manure as a substitute. The crop is very sensitive to high temperatures and to strong winds.

Fruit trees are also grown primarily on these sand lands, although they are by no means an ideal habitat, for fruit trees suffer severely and may die whenever the water-table is too high. The sub-soil water is at satisfactory levels during the winter and summer but it may rise too high during the *nili* season, especially on the lowest *gezira* nearest the river. The growth season of vegetables, being short, can be so arranged that damage is avoided, but fruit trees are in the ground for several years and are consequently more liable to damage. Fruit-growing, even more than vegetable-growing, is a capitalist enterprise: a small man cannot afford his land to earn no income until trees begin to bear fruit and fruit trees are so subject to disease that considerable specialist skill and knowledge is imperative. The fruit grown in Ashmoun are bananas, vines, oranges, lemons, mangoes, dates. Vines and dates alone may be crops of small farmers, an odd row of vines or an odd date palm. A banana plantation will last for three years and it gives the greatest quantity of crop, measured in money values, per feddan of all crops in the Delta.

In conclusion, an attempt to map the varying productivity of land in Ashmoun is presented in Figs. 7 and 8. The first is based on evidence collected during the field survey. The prime distinction is between that land which can follow the 'normal' rotation and that which cannot. That which cannot is either sandy land, particularly *gezira*, or land with impeded drainage, the former mainly in the west of the markaz, the latter in patches in the central depression. Within the area following the 'normal' rotation, distinctions are made between four classes of land on the basis of their maize yield. Maize is taken as the most suitable crop for this purpose on the grounds that as a subsistence crop its cultivation is standardized and its manurial treatment reasonably uniform. It may be held that differences in yield are more likely, therefore, to reflect differences arising out of differences of soil and less likely to reflect differences of human management. The second map is based on particulars of rent also recorded during the field survey. Rent is normally an unsatisfactory basis for land classification, for rent, as is well known, varies according to a number of factors extraneous to the land itself—size of holding, condition of buildings, proximity to markets. Moreover, rent is unsatisfactory evidence whenever only a small proportion of the land in the neighbourhood is rented and whenever there is such land hunger that rent levels are inflated. Both these conditions apply to Ashmoun. Nevertheless, despite these qualifications, there is in general terms a quite striking comparability between the two maps.

This Changing World

EDITED BY L. S. SUGGATE

REFUGEE INDUSTRIES IN WESTERN GERMANY

Refugees, almost a fifth of the West German population, have brought from their homelands industries poorly represented in Germany before 1945. Over two-thirds of 3,900 refugee companies are from beyond the Oder–Neisse rivers and Germany's 1937 boundaries, the remainder from the Soviet Zone and Berlin. By late 1953 they employed 270,000 workers, many non-refugees, and were expanding rapidly. Over 80 per cent of the firms, with 70 per cent of the workers, produce light consumer goods but there has been little re-establishment of refugee heavy industry. Refugee industry has partly made good the severance of Central German engineering and manufacturing from the Ruhr heavy industry.

Textiles and clothing from Silesia, Czechoslovakia, Poland, and the Soviet Zone form the largest branch. Nearly a third of the textile workers in West Germany are refugees while engineering (including instrument-making and optical goods) from the Soviet Zone follows closely. Most manufacturers of porcelain, glassware, artificial jewellery, toys, and musical instruments are from Czechoslovakia. The large food and drink industry shows no regional bias.

When restarting, refugees have difficulty in finding capital, with sharp competition from local firms who give better returns and security. They also have difficulty in buying in West Germany special machines needed by their industries; for example, during the temporary U.S. occupation of Jena, later in the Soviet Zone, in 1945, special optical machines were removed to Stuttgart, while others were later smuggled over the border. This enabled the Zeiss works to re-open in the West. Flight scattered skilled workers; key men were forcibly retained by expelling countries; and young men have not been trained to replace war losses, because of the war and lack of suitable institutes in West Germany. Industries formerly carefully organized or concentrated in a particular district have been broken and scattered; for example, the Lódź textile industry and the Rathenow lens makers.

Adjustment to new markets has been difficult. Firms frequently compete with their own plant in the homelands, now operated with semi-skilled non-German labour, selling inferior goods under heavy subsidy at abnormally low prices. New "state" firms commonly use names and patents of their German predecessors, with consequent legal infringements and costly litigation.

Refugee firms are predominantly in small towns and villages. Roughly a fifth (totalling a quarter of the workers) are in towns of 100,000 inhabitants, particularly in the Ruhr and Lower Rhine. True "refugee towns" have grown in deserted munitions works at Alexisdorf, Espelkamp (both Westfalen) and Waldkraiburg (Bayern). The vagaries of flight and establishment during the hard years 1945–8, when it was not possible to choose sites carefully, have created this commercially disadvantageous location, away from transport, raw materials and markets. The small, high-value articles produced, however, stand the extra costs.

The establishment of refugee industries has been encouraged by the government in the countryside to reduce migration from country to town, and several plans have been published to improve transport and power supplies. It is encouraged, too, in the depressed former naval ports of North Germany and for the diversification it brings to over-specialized Ruhr cities.

Recovery of refugee industry has been quickest in Bayern, which now has the largest concentration. Nearly all is from Czechoslovakia: Sudeten musical instrument makers are near Erlangen; glass makers from Gablonz and Steinschönau are in Mittelfranken and the Allgäu. Soviet Zone textile firms have diversified the industry of Hof and Münchberg, and revived the former industry of Augsburg, which also has leatherware and electrical goods from Berlin. Woollens from Sachsen and Lausitz are in Schwaben. The second concentration is in Nordrhein–Westfalen, which has been helped by former business connections. Soviet Zone cosmetics, pharmaceuticals, and confectionery are now in Köln, which has a tradition for such industries. The Aachen linen industry has refugee linen firms, while textile machine makers from Sachsen have started in the textile towns of Mönchen-Gladbach and Rheydt. Lódź textile manufacturers are in Düsseldorf, while firms from Reichenberg and Poznań are scattered throughout the Münsterland and Lippe. Readymade clothing from Silesia is established in Gelsenkirchen. Suitable raw materials have led to the settlement in Rheinbach and Düren of Bohemian glass makers, who are working as well in Hessen in the Lahn valley and near Kassel. The opening of Leipzig printing houses in Frankfurt am Main is the reversal of a historical migration.

In the main refugee districts of Land Niedersachsen and Schleswig-Holstein, firms have come from Silesia and East Prussia, while there are many from Poland. Olympia typewriters sold in Britain are made by a refugee firm from Erfurt in the Soviet Zone which has now a factory in the depressed former naval base at Wilhelmshaven. Oldenburg has many refugee woodworkers and furniture makers; and throughout the Northwest, local potatoes, cereals and sugar beet have been used by an extensive refugee distilling industry.

Although refugee industry as a whole employs only about 15 per cent of its 1939 labour force, some branches (musical instruments) have already 60 per cent of their former labour force. In contrast, refugee heavy industry has under 3 per cent of its 1939 numbers, illustrative of problems which have beset the industry in the already unbalanced West German economy. The firms from the Soviet Zone are usually larger than other refugee undertakings. The change in the last three years of German exports from basic goods to luxury articles and machinery has greatly helped refugee firms to consolidate their position, and they now rank among Germany's leading dollar-earning businesses.

Cartographic Department,
Clarendon Press, Oxford.

R. E. H. Mellor.

URANIUM FROM THE UNION OF SOUTH AFRICA

One of the chief regions of uranium production to-day is the Union of South Africa, whose Witwatersrand and Orange Free State goldfields are producing for export to the United States of America and the United Kingdom an inert uranium oxide ($U_3 O_8$) in considerable quantities. No production statistics are yet available, though it is apparent from profit yields in 1954 that the sale of uranium will increase working profits by at least 25 per cent.

The presence of radio-active minerals in the gold-bearing ores of the Witwatersrand Series has been known for at least forty years. This radioactivity was shown in 1923 to be due to the presence of uraninite (an impure oxide of uranium), found in the gold ores in such small concentrations that it could not hope to compete with the pitchblende deposits of the Belgian Congo, Canada and Bohemia. It was only in 1944 that the United States government interested itself in the possibility of uranium extraction from these Witwatersrand ores; by 1950 extensive field work, examination of nearly 500,000 specimens from every horizon of the gold-bearing reefs, and laboratory tests showed that, provided the difficulties of production could be overcome, the extraction was simple. After the formation of the South African Atomic Energy Board, the first pilot plant was installed in 1949 at Blyvooruitzicht Gold Mine, the second at Western Reefs Exploration and Development Co. Ltd. in February 1950 and by March 1955 fourteen plants were in production including four in the Orange Free State. Present plans envisage uranium extraction from the ores of 26 mines, though many will merely feed their residues into some central plant for treatment. Since the concentrate is an inert yellow clayey mass it can be easily transported to atomic energy centres overseas for purification and conversion to the more unstable isotopes. A total of £40 million has already been spent and it is calculated that a further £10 million will be required in capital investment before all the extraction plants have been completed.

The actual extraction process is not fully known, beyond the fact that it involves the crushed gold-bearing ores in additional agitation with dilute sulphuric acid, after it has passed through the gold extraction plant. Normally, large quantities of low grade ore (more than 65 million tons in 1954) are crushed, washed to separate the heavier gold particles, then treated with cyanide liquors. Gold cyanide is filtered off as a soluble salt, and the sterile residue passes out of the gold mine to be dumped. This residue or "slime" will in future be diverted to the uranium plant. (It should be remembered that not only are the current slimes available for treatment, but also the accumulations of the past sixty years.) Uranium sulphate filtered off can then be reduced to uranium oxide.

This will result in the use of yet another by-product from the gold ores, for these contain concentrations of 3 to 20 per cent by weight of pyrites, a mineral which has been neglected by all but one of the companies. Seven of the 26 mines are to use this pyrites in sulphuric acid plants, with a combined total production of 40,000 tons of 100 per cent acid per annum. Any surplus will be absorbed in local industry.

Other items which are required in filtration and precipitation of uranium oxide are manganese oxide, which will be derived from Postmasburg (C.P.)

as well as limestone, animal glue and vast quantities of water, all of which will be obtained locally. Gum arabic which is also needed will be imported.

The extensive production of uranium oxide is already having important effects on the structure of the gold mining industry. Older mines, particularly those of the Central Rand, which were thought to have reached the end of their economic lives, will be able to carry on until the price of uranium falls with increasing world production. Many reefs in the Witwatersrand Series which were not worked because their gold content was too low can now be worked for the combined profits on gold and uranium. (See C. F. Davidson, "The Gold-Uranium Ores of the Witwatersrand," *Mining Magazine*, vol. lxxxviii, 1953; also "Uranium soars to prominence in South Africa's Goldfields," *Engineering and Mining Journal*, vol. 154–5, 1953.)

University of Manchester. D. L. NIDDRIE.

LAND AND THE EGYPTIAN PEASANT

Long-overdue changes are now taking place in Egypt under the Land Reform Act of September, 1952, which is designed to do much more than redistribute land from the large estates, for an avowed object of the new measure is to strike at the "feudal mentality" enslaving the peasantry (some 70 per cent of the population), and at the same time to curb the power of the large landowners. This "feudal mentality" is thought largely to result from the pattern of land ownership in a country in which farmland is limited both in area and in possibilities for expansion. The pressure of a rapidly growing mass of land-hungry peasants, each anxious to own, or at least to rent, his own small plot of land, has forced land prices and rents to exorbitant limits. Some 2 million peasants are now landless and labour on the larger estates, as do the many who work or own plots of land too tiny to support them and their families. Agricultural wages are extremely low, and account for the poverty and indebtedness of the peasantry and their low standard of living. Malnutrition and endemic diseases contribute to lower vitality and sustain the apathetic resignation so characteristic of the Egyptian fellahin. The large landowner has dominated the peasantry by his wealth and political power.

The situation has steadily become worse not only because of the rapidly increasing rural population, but because of the fragmentation of holdings under the Moslem law of equal inheritance, illustrated by the figures in Table A.

Table A

DEVELOPMENT OF LAND OWNERSHIP IN EGYPT

	1900	1910	1920	1930	1940	1950
No. of owners	914,414	1,391,964	1,866,761	2,210,341	2,496,546	2,760,661
Area held (feddans)	5,114,052	5,463,789	5,535,352	5,790,050	5,841,011	5,962,662
Average per owner	5·57	3·90	2·96	2·62	2·34	2·16

(One feddan = 1·038 acres)

Whereas the number of landowners has trebled, the amount of land has increased by only 16 per cent; the result has been a notable fall in the average size of holding. However, these figures give no guide to the actual distribution of land in Egypt which offers a useful key to the social structure of the country. Table B clearly shows the maldistribution of land ownership, which the new measures aim to amend. It can be seen that a mere 6 per cent of landowners share between them two-thirds of Egypt's farmland; the remaining third is shared between two-and-a-half million peasants. This concentration into relatively few hands has led to unfortunate social and political effects, and to an unbalanced growth of the Egyptian economy. Only in recent years has a middle class arisen, while industrial development has suffered not only from limited investment, but also from the restricted market resulting from the minute purchasing power of the mass of the people.

Table B

LAND OWNERSHIP IN EGYPT, 1950

Size of holding (feddans)	*Owners*		*Feddans owned*		*Average feddans per owner*
	Number	*Per cent*	*Number*	*Per cent*	
Under 1	1,981,346	71·5	780,046	13·1	0·39
1–5	618,860	22·5	1,324,020	22·2	2·14
5–50	148,571	5·5	1,812,389	30·6	12·2
50–100	6,575	0·3	455,111	7·5	67·7
100–200	3,194	0·1	436,403	7·3	136·7
200–400	1,350	0·1	362,217	6·1	268·3
400–1000	577		345,548	5·8	596·9
1000–2000	127		169,670	2·7	1,335·9
Over 2000	61		277,258	4·7	4,545·2
Totals	2,760,661	100·0	5,962,662	100·0	

Compiled from *Annuaire Statistique de Poche*, 1952 (Cairo, 1953), Table 40.

This reform of land ownership is moderate in character. A limit of 200 feddans (acres) is now the maximum holding for any one landowner; excess land in the large estates is being expropriated for redistribution to the peasants. Landowners possessing the maximum holding may sell 50 feddans to each child, provided that no family holding is of more than 300 feddans. Some 2,000 landowners owning nearly 1,200,000 feddans are affected, and about 600,000 feddans are being taken from them to be redistributed in plots of between 2 and 5 feddans (according to fertility). It is estimated that some 150,000 peasant families will benefit from this redistribution which is being carried out over a period of five years. The Act also gives greater security of tenure to tenant farmers and generally reduces land rents—well over a million families will benefit in this way.

The total area to be distributed is no more than 10 per cent of Egypt's farmland, and it will not go very far to satisfy the great demand; many hundred-thousand peasant families will inevitably remain landless. It has been suggested that had the maximum holding been reduced to 50 feddans (the most the landowners might have hoped for had the revolution been of peasant origin), a more satisfactory redistribution might have been achieved. But even with this lower maximum the 1,500,000 feddans so released would be insufficient to satisfy all the land-hungry peasants with adequate plots. However, it remains true that the new maximum is high, particularly when the great productivity of Egyptian land is considered. It may well be that at some future date further and more radical land reform will take place in favour of the peasantry; the present measures are moderate in severity but accomplish their main object—to break the power of the old régime.

Already the redistribution of the title-deeds has begun, and by the end of 1954 some 100,000 feddans of land had been distributed. Reasonable compensation is being paid by means of 3 per cent interest-bearing bonds redeemable after thirty years; the peasants buy their holdings from the State by annual payments over this period. While the reform is unlikely to affect agricultural productivity adversely, it is questionable whether urgently-needed expansion will follow. It may be supposed that the fellah will work harder on his own plot, but it must be remembered that the greater part of the land being redistributed is already farmed in small plots, on a rented basis. The pattern of agriculture is unlikely to be much affected, although there will probably be an increase in grain acreage at the expense of cotton. In the past most peasants obtained some finance from their landlords, who provided them with seeds and fertilizers; it is hoped to secure these services through co-operative societies to be organized to include the smallest proprietors.

It is hoped that these measures, together with reclamation and conversion into peasant holdings of delta-marsh and desert margin (see A. B. Mountjoy, "Egypt's Population Problems," *Trans. Inst. Brit. Geographers*, No. 18, 1952),* will gradually raise the purchasing power of the peasantry and thus enlarge the internal market. Such conditions will favour an expansion of industry, and may thus lead to a further stage in planned development. The measures now being put into effect must not, therefore, be judged on face value alone. They are steps which should be regarded as precursors to a whole series of measures designed to grapple with Egypt's many economic, demographic and social difficulties.

Bedford College, University of London. ALAN B. MOUNTJOY.

RECENT ECONOMIC DEVELOPMENTS IN PERU

Since the war, and especially during the last four years, work has begun, with the help of foreign capital, on several large-scale projects to develop the natural resources of Peru. Relatively little capital is available in the country itself, yet owing to various factors large amounts of capital are needed before many of the potential resources of the country can be exploited. Roads, railways and towns have to be built and labour must sometimes be brought great distances to supplement local workers accustomed only to agriculture. On the other hand the low standard of living of the working population keeps labour costs down.

MINERALS

Petroleum concessions. In 1952, when a new petroleum law to encourage foreign investment in petroleum came into operation, the national output was still below the 1936 peak (1936—17,593,000 barrels; 1952—17,465,000 barrels), and many United States oil companies have since been granted concessions, mainly in three areas. So far no oil has been found in two of these—the Sechura desert and Ica areas. In the east, the selva of the Amazon basin, oil from a nearby field already in production is now refined at Agua Caliente, near Pucallpa (1952—200,000 barrels). There are oil seepages in many localities and by November 1954 6,813,000 hectares of concessions (an area greater than that covered by all the oil concessions in Venezuela) had been granted in the selva. Much drilling is in progress. If large quantities of oil are produced commercially in this part of Peru, a large market for the products is certainly assured in Brazil. The natural outlet to other markets is along the Amazon, while the most favourable point for an oil pipeline to cross the Andes to the Pacific coast at Pimentel (Chiclayo) or Paita (Piura) is over the Cuello de Porculla, less than 6,500 feet above sea level, the lowest pass in the Peruvian Andes; the provision of such a pipeline is a long-term project.

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* References thus marked in "This Changing World" are available on loan from the library for consultation by members of the Association.

Marcona iron ore. In 1952 a concession of 600 sq. km. was granted to the Marcona Mining Co. for the exploitation of iron ore in the department of Ica. $6 million have been invested. About 100,000,000 tons of iron ore (up to 60 per cent iron content) have been located. The overburden is everywhere under 20 feet thick, and the ore is being quarried. It is transported from Marcona to the coast, where the new port of San Juan has been equipped to handle it, along a newly built 30 km. highway in specially designed lorries each capable of carrying 60 tons. By contract with the Peruvian government a minimum of 500,000 tons is to be exported annually, a part of this via Chimbote. Shipment of ore began in April 1953 and already during the first half of 1954 Peru had become the second largest supplier of iron ore to the U.S.A. (January–June, 1954—from Venezuela, 2,047,000 tons; from Peru, 1,100,000 tons, followed by Chile.) About 800 persons are employed and a new town has been built near San Juan.

Toquepala copper deposits. Over 600,000,000 tons of 1 per cent copper ore have been proved in the Toquepala and Quellaveco areas of southern Peru. $2 million must be invested to develop these resources, and in November 1954 half of this sum was granted by the Export-Import Bank of the U.S.A. Before any copper can be produced 90,000,000 tons of overburden must be stripped at Toquepala and there must be constructed a new town and a concentrator at Toquepala, 160 km. of railway from Toquepala to Ilo, a power plant, new roads and port installations as well as a smelter and a new town at Ilo. About 3,500 workers will be employed, and after 4 or 5 years of preliminary construction work 140,000 tons of copper will be exported annually. When the project is completed this will be the largest single mining investment in Peru.

AGRICULTURE

In many areas along the coast of Peru work has been completed to increase the area of agricultural land and the supply of water in the irrigated valleys. One project has recently been finished to divert water from the Quiroz river to the Piura river at a cost of $11 million.

Of more far-reaching significance to the country may be the Le Tourneau Colonization Concession in eastern Peru. Early in 1954 an agreement was reached between the Peruvian government and the American firm of Le Tourneau whereby the latter will construct 50 km. of highway in the selva region of Peru in return for 400,000 hectares of colonization land. The land will be selected from a total area of 800,000 hectares by the government in the area to the south of Pucallpa on the Ucayali river. This project, which is still in the experimental stage, may prove to be of great importance to

Peru. Firstly it is an experiment in forest clearance by machinery (including special machines for pushing over large trees). Secondly it will make available for agricultural purposes almost as much land as is now used in all the irrigated valleys of the Peruvian coastal region (approximately 500,000 hectares). If the project is a success much experience will be gained and may be applied in other parts of the selva.

HYDRO-ELECTRICITY AND INDUSTRY

In 1950 work was begun on the construction of a hydro-electric power station in the Paucartambo valley to the east of Cerro de Pasco in connection with a new zinc refinery for the Cerro de Pasco Corporation. The Paucartambo is one of the headwaters of a tributary of the Ucayali river and is no more than a mountain torrent. The penstock of the power station measures 3,855 feet with a vertical drop of 1,546 feet. The generating station will have a capacity of 65,000 kW. The total cost of the project including the zinc plant is about $26 million. Up to 4,000 workers have been employed and the work will be completed by 1956.

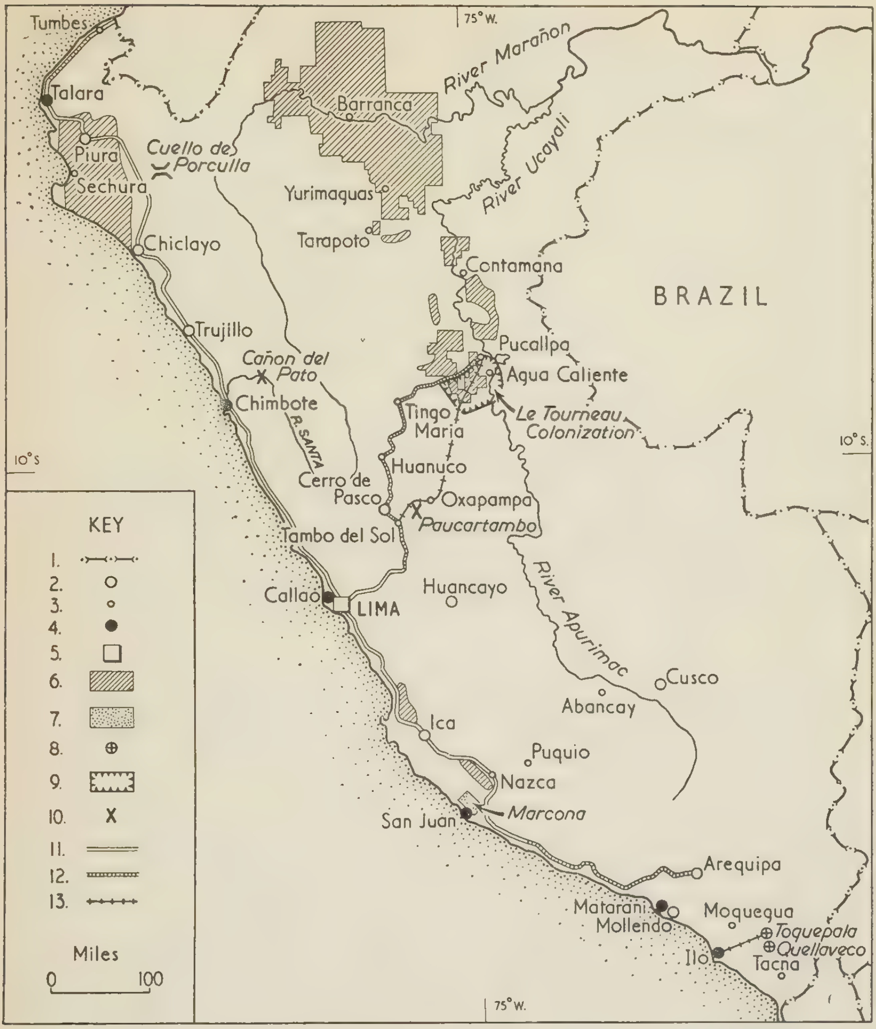
Owing to financial and physical difficulties, work has been slow on the hydro-electric power station in the Cañón del Pato, located in the Santa valley where the Santa river turns from the Callejón de Huaylas towards the coast. The plant is nearing completion and the generators are planned ultimately to have a capacity of 135,000 kW. Most of the power will be transmitted to the Chimbote steel works.

By the end of 1954 the construction of the iron and steel works at Chimbote on the coast about 400 km. north of Callao was far advanced. Advantages of the site are its proximity to the supplies of coal, electricity and limestone in the Santa valley and to the fact that cheap iron ore by agreement is available from Marcona, 400 km. to the southeast of Callao. The port of Chimbote is already equipped to serve ocean-going vessels. Work on the iron and steel works was begun in 1952 and is financed by French interests; total cost of the work at Chimbote and the Cañón del Pato is about $15 million. The plant is to have an initial annual output of 50,000 tons of finished steel products and will employ 800 persons; electricity will be used for smelting. At present Peru has to import all its steel requirements (in 1951, over 120,000 tons of steel, including manufactured articles).

COMMUNICATIONS

Road. The main means of communication by land in the Peruvian coastal region is the Pan American highway. Between Tumbes and Arequipa, a road distance of almost 2,400 km., over 1,900 km. have now been surfaced with asphalt, and several hundred kilometres of the highway have been built or rebuilt with a 30-foot wide surface. With the steady increase of road traffic in Peru in recent years the improvement and maintenance of this highway has become essential.

Rail. At present there are only two important railway projects in Peru. In connection with the Toquepala copper deposits a railway (160 km.) is to be built from Toquepala to Ilo. Of more than local importance is the Amazon railway project (see *The Times Review of Industry*, November 1953). Work has begun on the construction of this railway from Tambo del Sol (on the line from Cerro de Pasco to La Oroya and Lima) towards the selva. This will be the first railway to connect the coast of Peru with the navigable



Key.—1, International boundaries; 2, Towns with over 20,000 inhabitants (1952); 3, Other towns; 4, Seaports recently improved or to be improved; 5, Greater Lima; 6, Main petroleum concessions (1953 in coastal area; July 1954 in selva); 7, Marcona mining concession; 8, Copper deposits, Toquepala and Quellaveco; 9, Le Tourneau Colonization, general area of 800,000 hectares; 10, Hydro-electric stations under construction; 11, Pan American and Lima-Pucallpa highways, with asphalt surface, December 1954; 12, Pan American and Lima-Pucallpa highways without asphalt surface; 13, Proposed railways.

waterways of the Amazon basin (at Pucallpa, already linked to Lima by road); it will open up new lands for colonization, serve the Le Tourneau Concession and enable products of the selva to reach the Lima area for consumption and Callao for export.

Ports. Several seaports have been developed in recent years. Talara, with its large petroleum refinery, handles the oil produced by the International Petroleum Company in northwest Peru. The port facilities have recently been improved, the refinery enlarged to handle 45,000 barrels daily instead of 30,000, while the town is being rebuilt with brick buildings to replace the wooden buildings of the first decades of the century. Chimbote, near the mouth of the Santa river, was improved in 1945 to handle coal produced in the Santa valley; when the iron and steel works goes into production Chimbote's importance will increase. At San Juan, a 300-metre long pier has been built to handle annually up to 2,500,000 tons of iron ore from the Marcona deposits. With the improvement of the road from Nazca via Puquio and Chalhuanca to Abancay this port could be used in the future as an outlet for the cordillera and selva areas between the central and southern railways of Peru. At Matarani a wharf was completed in 1941 to supplement the facilities of the exposed roadstead of Mollendo 12 km. to the south, the port of Arequipa and southern Peru. In 1951 a railway was completed between Matarani and La Joya on the southern railway of Peru; now Matarani is to have new grain-handling facilities for the importation of wheat and other cereals to southern Peru and Bolivia. Ilo, now a small port, the outlet for the Moquegua valley, is to be improved to handle copper exports from Toquepala.

(Principal sources: issues during 1953–4 of the *Peruvian Times*, a Lima weekly in English; official commercial information.)

Formerly of the University of Nottingham. J. P. Cole.

An Economic Map of Europe

H. R. WILKINSON

The publication of Professor William-Olsson's *Economic Map of Europe** has long been awaited by all geographers interested both in the regional geography of Europe and in cartographic techniques. His quantitative economic map of Sweden† is already sufficiently well known to a wide public to arouse interest in his new larger venture. The favourable reception of his Swedish map, as well as the considerable experience gained during its production encouraged Professor William-Olsson to embark upon the construction of an economic map of the whole of Europe. To this end, he solicited the help of a number of European geographers. For England and Wales, for example, he had the collaboration of Professors S. H. Beaver and L. D. Stamp, and for Scotland that of Mr. J. B. Fleming. In view of the great problems of generalization, the variability and, in some instances, the inaccessibility of data, as well as of the technical difficulties of production, the map was an ambitious undertaking. The results amply justify the long and tedious research and the protracted correspondence which are invariably associated with an international project of this kind. At last we have a map of Europe which gives us a broad but reasonably accurate view of its current economic structure and is at the same time a beautiful example of restrained cartographic art—simple, effective, useful and aesthetically satisfying.

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* *Economic Map of Europe*, W. William-Olsson, Professor of Economic Geography at the Stockholm School of Economics; 1 : 3,250,000, 48 × 64 ins., in two sheets. Published by Generalstabens Litorgrafiska Anstalt, Kantförlaget, Stockholm, 1953.

† *Ekonomisk-geografisk Karta över Sverige*, 1 : 1,000,000, Stockholm, 1946.

The map is drawn on Alber's equal area projection, so that areal symbols are correct both absolutely and relatively, and yet error of distance is not too great. Sea areas are shown in two shades of blue to enable the continental shelf to be distinguished from deep sea, although no attempt is made to show fishing grounds. The land area is shaded in various tones of grey and white to indicate intensity of agricultural use. Dark grey has been used to show extent of land above the forest limit and also the tundra. Light grey is employed to indicate forest, meadowland and all other land which is not directly under the plough or which is not otherwise cropped. Deserts in this non-arable category are stippled. To show the distribution of arable land, inclusive of vineyards, orchards and olive groves etc., white squares of uniform size are employed, each square representing 100 square kilometres and each being true to scale. To complete what might be termed the base of the map, the railway network is shown together with rivers and chief canals.

The subdued colouring of the base helps to throw into high relief variously coloured 'three-dimensional' spheres which depict in a quantitative fashion the distribution of categories of economic activity. The illusion of sphericity is created by shading each symbol and is deepened by giving to each a purple shadow. Each symbol represents a settlement with a population of over 10,000 inhabitants.* The size of symbol is proportional to the population total of each settlement and each is coloured according to its particular economic character as judged by the occupations of its inhabitants. Since only a limited number of colours are available to any cartographer, the numerous occupations and industries must be grouped in a few categories and much of the value of the map depends on the degree of success which attends this classification. Any economic map is meaningless unless the principle behind the classification of data is clear. In William-Olsson's classification, if half or more of the urban population—excluding those who are possibly occupied in areal production†—is supported by service occupations, the town has been termed a 'service-town' and is marked by a blue-black sphere (blue-black being a more effective colour than black alone). Apparently William-Olsson includes all forms of transport as a service. This leads him to classify nearly all ports, for example, as service centres, whereas in fact the regional services provided by some ports are very poor. With this exception, the classification serves well enough. If, on the other hand, more than half the population is concerned in industry or handicraft it has been classified as an industrial town and coloured according to one of nine categories devised for the purpose. This ninefold industrial classification takes into consideration both nature and range of products and thus it enables both type and diversity of industry to be portrayed. Villages and village-towns which are separately distinguished, represent settlements which, although they have populations of over 10,000 are nevertheless primarily places of residence for people working in the surrounding area and engaged in rural activities or fishing, etc. The map depicts large numbers of such settlements in the plains of Hungary and

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* The author points out that it has been necessary in the case of crowded areas to include in the symbol for larger towns populations of smaller towns peripheral to them. Special inset maps of industrial England and part of north-west Europe supplement the general distributions given on the map.

† i.e. "low concentration" activities, comprising agriculture, forestry and fishing.

Roumania and in the Mediterranean lands where farming population is nucleated rather than dispersed.

The sources of information upon which the map is based are explained in detail in a booklet accompanying the map. For western Europe the sources appear to be up-to-date and reliable but this is not so true for many countries in eastern and southern Europe where information could only be acquired indirectly. The post-war migrations of population have not been taken into account and some distributions, especially in Germany, may therefore not be completely accurate. William-Olsson maintains, however, with some truth that the general structure of European settlements and the exploitation of the resources of the continent are the cumulative work of many generations and his general picture is not invalidated by failure to take all recent changes into full consideration.

Lack of detailed information about land use in countries such as Spain, Albania and the Soviet Union left William-Olsson with the choice of abandoning uniformity of presentation, or of generalizing to a greater degree than he would have wished. He chose the latter course and thus he had to include in one category of use, lands so diverse as the rich permanent grass of the Cheshire plain, the pastures of the Jugoslav karst, the Pripet marshes and the vast stretches of forests in northern Europe. Perhaps some attempt should have been made to differentiate marsh and forest at least but supplementary studies which are promised may be the proper solution to these shortcomings. Census returns and occupational statistics comprise the chief source for information about industrial distributions, and since occupational returns are compiled on such varying bases in different countries strict comparability is hardly to be expected even in western Europe. In the case of the Soviet Union, no occupational statistics were available at all. Fortunately some information about the Soviet census of 1939 (population totals for towns with over 50,000 inhabitants) was available. These data could be supplemented by information about the distribution of industrial production given in the Great Soviet World Atlas. From such scattered sources William-Olsson succeeds in giving an adequate picture of the economic structure of Soviet towns. To distinguish, for example, between service and industrial towns he plotted population totals against index values of industrial production, information about the latter being drawn from the Soviet Atlas. In the first place, a town with a large population and a low production (in terms of index roubles) could be regarded as either a village, or a service town, or an industrial town engaged in an industry with a low production value in proportion to workers employed. In the second place the Soviet Atlas could be consulted to verify the type of industry characteristic of the town and this further information allowed a final classification to be made. Thus by statistical ingenuity, by inference, and by checking conclusions by reference to known examples, the major deficiency in data was remedied. By such devious routes is the Iron Curtain occasionally penetrated.

The place-name policy adopted in the map deserves some comment. Title, acknowledgments, legend and some major place-names are given in English, French and German. Names of towns, rivers, lakes etc., are spelled precisely as in the countries concerned except where transliteration into the Latin alphabet has been necessary. In the case of the Soviet Union, the list provided by the United States Board on geographic names has been utilized. The inset map of industrial England is not without some minor errors which the interested user will detect for himself.

Without venturing upon an exhaustive critical analysis, perhaps a few general impressions of the picture presented in the map are not out of place in view of the new perspective which it gives to the current economic geography of the continent. The map reveals an extraordinary concentration and centralization of industry as still characteristic of western in comparison with eastern or southern Europe. The great cluster of symbols over the Ruhr emphasises the leading role which that coalfield continues to play in the European economy. The dominance of German industry as measured in terms of its density of distribution, its quantity and its variety is a striking feature of the map.

In Great Britain, there appears to be a strong contrast between the industrial towns of the north and the service-towns of the home counties. In William-Olsson's scheme, for example, Manchester, Birmingham, Glasgow, Leeds and Sheffield all emerge, on a comparative basis, as industrial rather than regional centres. In other words their regional functions, admittedly well developed, are nevertheless subsidiary to their industrial functions. In no other European country is this quite so true of the provincial centres as in Britain. The marked superiority of London and its region over the rest of the country in the matter of services is clearly demonstrated.

Of interest not only to economic but to political geographers also, is the place of the Soviet Union in the European economy. The map shows that whereas in peninsular Europe industry is comparatively highly concentrated, dispersal is the chief feature of Soviet industry. It is true that there are zones of industrial development within the Soviet Union—the Moscow region, the Urals, the Donetz basin and the Lower Dnieper basin being outstanding, but within these zones industrial towns are scattered. Nowhere are the symbols grouped together to signify the closely built-up urban region that one finds in western Europe. Secondly, and just as significant, the great majority of industrial towns in Soviet Russia are shown as primarily engaged in metal working and ore extraction. There is much less diversity than might be expected. The diversification of Russian industry only started to take place on any considerable scale in 1947 and is therefore not shown on the map, and even if it were, it could hardly be so significant as to modify the basic pattern to any great extent. The drive for more consumer goods and services has in fact been halted recently. Again, the classification of types of industry adopted in the Soviet Atlas, and upon which William-Olsson was dependent, is on a different basis than that for the rest of Europe. But even if both these considerations are taken into account, the margin of contrast between the Soviet and say the German economic structure is so wide that fundamental differences remain. These differences are emphasized by a third point of contrast. The Soviet Union appears from the map to suffer from a deficiency of service-towns and from the lack of a fully developed urban hierarchy as compared even with parts of eastern Europe. This is especially so when the area of land under arable cultivation is taken into consideration. The proportion of arable land in the Soviet Union (with the exception of the Aral–Caspian desert, the Pripet marshes and the lands north of the sixtieth parallel) compared favourably with any part of Europe.

One is led, therefore, to the conclusion that, as far as the evidence on this map is reliable, the great mass of Soviet peoples in Europe still live in poorly-serviced agricultural communities, and although heavy industry is well developed, the processes of industrial concentration, centralization and diversification which one associates in western Europe with high standards of technical efficiency and economy of effort have hardly begun. But if it compares unfavourably in times of peace, the pattern of Soviet industry renders it less vulnerable in time of war.

The absence of any considerable population or intensive agriculture north of the parallel of 60° N., which is true of the Soviet Union, also applies to the rest of Europe, with the notable exception of Finland. Not only are there considerable areas of arable land north of this line in Finland but a number of service-towns also which, apart from ports, are lacking elsewhere. Iceland can boast only two symbols, one for arable land and one for Reykjavík itself. Certain of the upland areas of Europe lack symbols, including the Northwest Highlands of Scotland, which compare unfavourably with even the karst of Jugoslavia. The large areas above the forest limit in the Alps in comparison with the negligible amount in the Pyrenees and in the Carpathians are notable and reflect the contrasts in scale and architecture of these mountain systems. Today considerable industrial towns are situated all round the periphery of the Alps—in the Bernese Oberland, in lower Austria, in Slovenia and in the upper plains of Italy; all derive their importance from water power as well as from the great routeways through the Alps. How small in comparison are the power resources of the Pyrenees and the Carpathians.

In Spain numerous towns are marked with a symbol which signifies uncertainty about their occupational character. In no other European country, not even in the Soviet Union did William-Olsson find it necessary to use this sign with such frequency. Apparently much of Spain is *terra incognita* as far as its economic geography is concerned.

The Geographical Association

SPRING CONFERENCE, YORK, 12TH–16TH APRIL, 1955

In a blaze of sunshine and fine spring weather a record gathering of over 200 members met in the historic city of York where a study was made of many aspects of one of England's most interesting major regions. Excursions ranged from the Pennine summits of the Malham region on the one hand to the Howardian Hills, North York Moors and Western Wolds on the other. Within York itself, members studied the various industries associated with the modern city, the medieval walls, the Kirk Museum and the treasures of the Minster library. We are greatly indebted to the Lord Mayor, Alderman F. Wright, for a Civic Reception at the Mansion House.

As a background to the attractive programme of visits and excursions there was an excellent series of lectures concerned with the physical basis and historical geography of the region, and with the study of York as the regional capital. These were contributed by Professor R. F. Peel and other members of the staff of the Department of Geography in the University of Leeds, and by Mr. W. C. Chapman, Vice-Principal of St. John's College, York. To these speakers and to Mr. G. de Boer, lecturer in geography in the University of Hull, we are deeply indebted for stimulating help both in lectures and in the field.

Two additional outstanding general lectures completed the programme. One given by Mr. W. M. Beresford, a leading economic historian, dealt with new towns of England and Wales between 1086 and 1650 and will long be remembered by those who heard it as a major contribution to the geographer's understanding of urban evolution in this country. The other was a brilliant lecture by Mr. P. F. Taylor, a member of the British North Greenland Expedition, who gave a fascinating account of the expedition, illustrated by more than 150 very beautiful coloured slides.

The conference concluded with a social and dance which in post-war years has become an established feature of these spring meetings, and it was a pleasure once again to see so large and light-hearted a gathering of members enjoying until midnight the party so ably directed by the Master of Ceremonies, Mr. Copping.

To a very large number of members our warm thanks are due for the fine co-operative effort that made this conference so happy a venue for geographers. To the Council of St. John's College we are indebted for the use of the College buildings for our meetings and residence; to the staffs of Leeds and Hull University Departments of Geography for the direction of the lectures and excursions; and to the York Branch committee for the thorough staff work that lay behind the general organization of the conference. Last, but not least, and in abundant measure, should we express thanks to the Honorary Conference Organizer who bore the burden of administration, which, as our Spring Conferences grow in size, calls for increasingly arduous labours. To Mr. R. O. Smith (and to Mrs. Smith, who gave such able clerical assistance) we owe a very special vote of thanks in this respect.

BRANCH NEWS

A Conference of Branch Secretaries was held at Sheffield on Saturday, 25th June, which was very well attended and gave a good opportunity for the exchange of ideas, problems and suggestions for the improvement of branch facilities and inter-branch work. A report of the Conference, prepared by the Chairman, Mr. W. R. A. Ellis, Liverpool Branch, will be circulated to all branch secretaries.

Winchester and District. We are very pleased to congratulate the members in the Winchester area who have formed there a new branch which promises by its vigorous inception to be a strong centre of activity. Professor F. J. Monkhouse has accepted an invitation to be President of the new branch. Enquiries about branch activities should be addressed to the Honorary Secretary, Miss B. D. Kelly, Canberra, 51 Stockbridge Road, Winchester, Hants.

ORGANIZATION FOR SCHOOL EXCHANGE VISITS

A scheme for the arrangement of exchange visits amongst schools is suggested by one of our members, Mr. A. E. Rivers. Schools which would co-operate in such a scheme would afford facilities (mainly in the form of accommodation) for visiting schools to undertake field work in their districts, advantageously with contracts between schools in widely differing regions. Local excursions for the visiting school could be organized either by the local staff or by the visiting staff, or by both jointly; in effect, each school would become a local field centre, the visiting party being accommodated either at the school or, preferably, at the homes of pupils, hospitality being returned during a subsequent return visit.

This scheme would stimulate interest in schools and geography teachers in the potentialities of their local districts for field work and would encourage school parties to explore and study contrasted regions at a reasonable cost. Accounts of similar exchanges are reported in the I.A.A.M. Handbook, *The Teaching of Geography in Secondary Schools* (Philip and Son, London, 1952, pp. 359–69). Members who are interested in this proposal to form an association of co-operating schools should write to Mr. A. E. Rivers, Michenden School, Southgate, London, N.14, who will welcome comments and suggestions.

SALE OF BACK NUMBERS OF *Geography* AT SPECIAL RATE

In order to reduce surplus stocks of certain parts of *Geography*, we are offering these for sale at 1s. each. The parts concerned are chiefly between 1927 (vol. 14) and 1939 (vol. 24), with a few others before and after that period. Lists of surplus parts will be supplied upon request to members who wish to select numbers for purchase.

PREPARING AND STORING VISUAL MATERIAL

At our last Annual Conference, Mr. Alan Vincent, a member of the Westminster Branch, mounted an exhibition of his teaching materials in the Visual Aids Exhibition. In a series of three articles in the March, April and June issues of *Visual Education*, he now provides much useful information on the preparation, finishing and preservation of visual teaching materials, which will be of great value both to the geography teacher who already has a collection of pictures and maps and to the amateur draughtsman who is preparing new material or school journey and museum exhibits. Suggestions refer particularly to lettering and shading aids, versatile duplicating facilities and ingenious methods of protecting and storing the variously sized illustrations and notes which the geography teacher collects over a number of years; sources of the art materials used are given. *Visual Education* (1s. per issue) is published by the Educational Foundation for Visual Aids, 33 Queen Anne Street, London, W.1.

A Geographer's Reference Book

Attention is drawn to the advertisement facing this page for this new and independent publication edited by Mr. C. H. Saxelby, which is to be published in October and distributed through the Geographical Association. Members who have already ordered copies (at the concession price of 11s. post free) on the application form issued with the April number of *Geography* should now send their remittance to the Assistant Secretary, making cheques payable to the Geographical Association. Orders will be forwarded by post immediately upon publication. Advance orders at reduced price can still be accepted from members of the Association and may now be sent direct to the Assistant Secretary at headquarters, accompanied by remittance.

Weather SCHOLARS' SUBSCRIPTION SCHEME

Teachers and students of geography who are interested in meteorology, organize meteorological societies, or maintain meteorological recording stations, will be glad to learn of a new scheme recently introduced by the Editors of the journal *Weather* (which is advertised elsewhere in this issue). This is the Scholars' Subscription Scheme under which school pupils may subscribe to *Weather* at the reduced rate of 12s. 6d. post free annually. The ordinary annual subscription is 24s. The necessary application forms can be obtained from *Weather*, 49 Cromwell Road, London, S.W.7.

Reviews of Maps and Books

With very rare exceptions, books reviewed in this journal may be borrowed from the Library by full members or student library members of the Association.

Ordnance Survey Six-inch Map of Great Britain on National Grid Lines. Ordnance Survey. 1955. 5s. per sheet paper flat.

It has recently been announced that all six-inch maps now being produced by the Ordnance Survey are on National Grid Sheet lines in either a Provisional or a Regular Edition (O.S. *Progress Review*, April 1955). Representative examples of the 850 sheets already published illustrate the nature and extent of innovations incorporated in the current editions of this widely used map.

The familiar rectangular quarter sheet (18 in. × 12 in.) of the old county series has been replaced by a square sheet (18·64 in. × 18·64 in.) representing an area of 25 square kilometres (9·65 sq. miles) which quarters the 1:25,000 sheet. The new map is thus related to all other maps and plans based on the National Grid. No longer is it necessary to refer to a county index diagram to find the number of the six-inch sheet covering a given area: its designation can be discovered at once from any relevant small scale sheet showing 10 km. grid lines, the sheet lines of the 1:25,000 map and it is known by the map reference of its parent 1:25,000 sheet with the appropriate suffix N.E., N.W., S.E., or S.W.

The new sheets bear a close resemblance to the 1:25,000 sheets; they carry grid lines at 1-km. intervals, with tenths indicated in the margins; their outer borders display scales in miles and furlongs, yards, feet, chains and links; reference panels for the conventional signs (many of which are new), index and survey diagrams and an explanation of the reference system are pleasingly grouped in their southern margins. On the map itself contours are finely drawn and figured in brown at 25-feet intervals (every fourth contour is strengthened) but all other information is in black. Clarity and legibility are, however, remarkably maintained even in the built-up areas (public buildings are shown in solid black, other roofed buildings in black hatching which is agreeably less dense than on earlier editions). The excellence of the draughtsmanship is matched by unrivalled accuracy, for the 50 Regular Edition sheets already published (covering parts of Devonshire, Gloucestershire and Essex) have been compiled from 1:2,500 scale plans surveyed within the last eight years. Where the revision of constituent plans is less complete the six-inch compilations are styled Provisional. About 800 of these sheets have appeared which differ in varying respects from sheets of the definitive edition. Details of the areas covered to date by the Provisional Edition are available in the O.S. *Progress Report* and monthly Publication Reports.

For the general appearance of the Regular Edition sheets there will be unstinted praise. Moreover, experience in the laboratory and field has shown that the new sheet is well-nigh ideal for detailed local study and as a base map for field observations. It covers a convenient area, is of a convenient size (one fold along the second grid line from the bottom reduces it to the manageable proportions of its predecessor) and faithfully portrays the "shape of the ground". Here is further encouragement for geographers of all ages to go out and record the basic facts of their subject.

R. S. W.

The East Midland Geographer. Department of Geography, University of Nottingham. 15·5 × 25 cm. 48 pp. approx. June and December. (No. 1, June 1954.) 4s. 3d. post free.

This new journal is a publication of the Department of Geography of the University of Nottingham and is issued at present twice a year. Articles and other features will generally be related to the East Midlands and changes in the geography of that region. Professor K. C. Edwards introduces the region in his article in the first number of the journal "The East Midlands: some general considerations", discussing its historical development and its present administrative and industrial significance. In addition to illustrated articles, the contents include "East Midland Record," designed to provide up-to-date information on current developments in the region; in the first two numbers, this feature includes notes on: town growth in the East Midlands; a new centre of oil production (Plungar, Vale of Belvoir); the Peak District National Park; lead mining in Derbyshire; tidal flooding on the lower Trent; and the recent industrial growth of Towcester. Titles of higher degree theses and first degree dissertations prepared in the Department of Geography at Nottingham in recent years are also listed.

The style and format of this new periodical are both pleasing. Teachers outside as well as within the East Midlands will find it a source of detailed and up-to-date information; they will at the same time find useful examples of aspects and methods of regional study and methods of cartographic expression which could be successfully adapted in school work. The journal can be obtained from the Editorial Secretary, The Department of Geography, University of Nottingham, Nottingham.

M. O.

The Soils of the Wem District of Shropshire. Memoirs of the Soil Survey of Great Britain. (Sheet 138.) E. Crompton and D. A. Osmond. 16·5×24·5 cm. vii+79 pp. London: H.M.S.O., 1954. 10s. 6d.

This memoir and the accompanying soil map appeared 15 years after the Soil Survey was established, and even now are largely based upon the work of G. W. Robinson, W. Morley Davies and others in the pre-Survey era. The map is on the same sheet lines and base map as the corresponding one inch to one mile geological maps (New Series), with the National Grid superimposed. The latest map (*Glastonbury* Sheet) is on a more modern base.

The memoir gives an all too brief sketch of the relief and climate of the area followed by more detailed chapters on the parent materials, soil survey methods (written for the non-specialist), soil series and agriculture. Two appendices on detailed analyses of soil profiles and a glossary complete the text. The description of the soil series is the most important chapter, and provides in readily accessible form previously published material scattered through many publications. Local N.A.A.S. officers contributed the agricultural information, which supplements, rather than supersedes Dr. E. J. Howell's L.U.S. report on *Shropshire*, especially regarding war-time changes and local farming systems.

Although the memoir lacks cohesion in places, it will provide a very useful basic text for local studies in this area and will also give the key to the soil types of adjacent areas. The report is avowedly interim in character owing to the limited financial and manpower resources of the Soil Survey.

G. T. W.

Also received: **The Soils of the Glastonbury District of Somerset. (Sheet 296.)** B. W. Avery. iv+131 pp. 1955. 15s.

The Domesday Geography of Midland England. H. C. Darby and I. B. Terrett (editors). 16 × 24 cm. xv + 482 pp. Cambridge: Cambridge University Press, 1954. 55s.

The second of the half dozen volumes on Domesday Geography which Professor Darby has planned is now available, and readers may hope that the later volumes will appear more rapidly now that a pattern of treatment has been established. For only in volume six, with the whole picture before him, will the senior editor embark on commentary and interpretation. As they set out the counties one by one he and his collaborators do not allow us to forget for a moment all the difficulties, discrepancies and anomalies inseparable from the vast enquiry which King William decreed. With immense labour they have unscrambled the information so as to fit it to present day county boundaries, making it thereby all the more valuable, not only to local historians but to the many schools and colleges which engage in regional studies of the home area. The nine Midland counties are first treated completely as separate units, and then summarized as a whole, when the maps bring out the startling contrast of social structure between, say, the Cotswolds with a high proportion of serfs and a negligible free peasantry, and the borders of Leicester where more than half the population were freemen. There is tantalizingly little to be learned about urban life, although the immense importance of the Droitwich salt industry is plain, and Gloucester was already interested in nail-making. The maps, numbering 159, are beautifully drawn and a model of good technique. It would have been helpful to have the areas of the counties stated, and an explanation of the use of italics in the Index and of folio numbers in the text. E. G. R. T.

The Archaeology of Sussex. E. C. Curwen. 2nd edition revised. 14 × 20·25 cm. xx + 330 pp. London: Methuen and Co. Ltd., 1954. 25s.

When first published in 1937 this book was recognized as one of the best of the County Archaeologies and the appearance of a second edition is most welcome. Partly because of the rich material, partly because of Dr. Curwen's ability in effecting a smooth transition to and from general and local themes, it is of more than regional value, e.g. the lucid description of the Celtic field-system conveys information applicable through much, at least, of southeast England. It would be difficult to overemphasize the relevance of the whole to geography, in describing the first stages in the evolution of the cultural landscape.

The general format shows no marked changes but the results of more recent discoveries and investigations (including the work on the Piltdown skull) have been incorporated. The interpretation of the function of the Neolithic causewayed camps is unchanged and should be compared with that of Professor S. Piggott in *The Neolithic Cultures in the British Isles*, Cambridge University Press, 1954. Further reference to sites is much facilitated by the provision of grid references. E. M. Y.

The Discovery Book Series. Book Three. Part 1. Exploring the World, Part 2. Globe and Map. O. Garnett. 15 × 20·5 cm. vii + 152 pp. vii + 55 pp. Oxford: Basil Blackwell, 1953. 5s. 9d. and 3s. respectively.

Book III of Olive Garnett's *Discovery Books* has the same strong binding and excellence of layout and wealth of valuable illustration as the two preceding books. It differs from them in being published in two parts.

Part I, *Exploring the World*, tells the stories of exploration from Marco Polo to Magellan in 152 pages, 54 illustrations (mainly photographs) and 37 maps. These stories are told in simple well-considered language and are as difficult to stop reading as most adventure tales, but these are true tales which the children ought to know. This has been done before but never with the geography teacher's needs so clearly in view. Every incident, every extract from the records and every illustration has been selected to enable child and teacher to get the utmost educational value from the stories.

The child has his world to discover and through these stories he will share many of the problems which faced the explorers, and will experience with them something of the excitement of discovering new worlds and a growing realization of the world's true size and nature. The danger of painting on such a wide canvas is avoided by clothing particular incidents with a wealth of circumstantial detail in the form of extracts and telling pictures. Recent pictures of natives preparing "flour" from the pith of the sago palm illustrate Marco Polo's account, which was not believed when he reported it. The uncertainties and dangers of the first penetration of the Magellan Strait is admirably told in words with four photographs to set the scene.

If there is any topic where history and geography must be told together to make sense, this is it. The gradual filling in of the map of the world is illustrated by 6 world maps—the first, of 1460, blank except for parts of the Old World, and the last, of 1600, showing the greater part of the world as we know it today.

Teachers are familiar with the use of stories to provide "pegs" on which to hang geographical ideas. This book bristles with such pegs carefully rather than accidentally provided. No attempt is made to "explain" the monsoons, but their effects in practice are clearly brought out from the experiences of the explorers and provide an open invitation to the keen child to ask and the teacher to tackle. But the book is designed to do more than all this.

As with Book I, *Looking and Doing* and Book II, *Finding Out*, this book is an application at school level of the principles of teaching geography dealt with in Miss Garnett's *Fundamentals of School Geography*. In the first two books she has dealt with the geographical skills of accurate observation in field work and accurate imagination through map work as they are made to arise from the substance of the main books. Book III demands an understanding of the globe and the use and limitations of atlas maps and in this case all the technical matter is gathered together into a separate book, Part II, to avoid interrupting the story of exploration and because the principles involved need a coherent and sequential treatment of their own.

Part II, *Globe and Map* is a definitely explanatory text to be used either as a reference in connection with Part I or independently. It deals in order with: Horizons, The Round Earth, Sunrise, Sunset and Noonday Shadows, Finding our Position and Maps of the World. It is intended to be used precisely in the order set out, for great care has been taken to build up basic concepts of position, navigation, day and night and map representations. On a round world these are very difficult concepts and a great number of adults never get them clear. As with arithmetic a step missed means confusion ever after. Here a determined effort has been made to foresee and forestall every possible misconception. The result is a step by step treatment based on trial and error in many classrooms over a long period and is the most thorough and most foolproof treatment yet seen.

Both of these books contain a "Things to Do" section at the end of each chapter, as with the previous books. These consist of appropriate practical jobs which are really worth the time which the children may spend on them. E. F. M.

Brighton: old ocean's bauble. E. W. Gilbert. 14 × 22·5 cm. xvi + 275 pp. London: Methuen and Co. Ltd., 1954. 25s.

Many books have been written about Brighton, and the story of its emergence as a resort and of the fashionable life of the Regency town is familiar. But there are other ingredients that give Brighton its peculiar flavour, and in this balanced account of the growth of Brighton by a geographer these are given due notice. As a resort Brighton is now two hundred years old, and although the imprint of the Georgian period is still strong upon the face of the town, Brighton has grown enormously since the coming of the railway in 1841. The story of the Victorian and post-Victorian development of the town is quite as significant for an appreciation of modern Brighton as the earlier phases of its history. Very properly, therefore, Professor Gilbert devotes half his book to this later period, during which Brighton has grown from a town of fewer than 50,000 inhabitants into a conurbation of a quarter of a million.

Two valuable introductory chapters deal with the emergence, growth and character of English resorts in general, and serve to put the development of Brighton into perspective as a particular example of a remarkable and distinctive aspect of the urbanization of this country.

One could wish that there were more popular books on our towns that gave such evidence of scholarship. The book is well illustrated with maps as well as with period drawings and photographs and there is a very useful bibliography. Both author and publishers are to be congratulated upon its production. A. E. S.

Geographical Articles

Listed from Periodicals received in the Library

CONTINUED FROM VOL. XL, PP. 141 TO 143

Journals listed here may be borrowed from the Library by members of the Association. References are listed according to the classification published in the *Annals of the Association of American Geographers*, vol. xxvii, June 1937. Authors' reprints presented to the Library are included in the list of articles. New additions to periodical accessions (since the last publication of this list) are shown below in italics.

A of Sc—The Advancement of Science. AUCS—Annales Universitatis Mariae Curie-Sklodowska (Lublin). EG—Economic Geography. GA—Geografiska Annaler. GB—Geographical Bulletin. GJ—Geographical Journal. GN—Geografiska Notiser (Sweden). GR—Geographical Review. GRI—Geographical Review of India. GTD—Geografisk Tidsskrift (Denmark). H—History. IBG—Institute of British Geographers. IG—Irish Geography. IGJ—Indian Geographical Journal (formerly Journal of the Madras Geog. Assoc.). J of G—Journal of Geography. MJTG—Malayan Journal of Tropical Geography. MO—Marine Observer. NG—New Zealand Geographer. NGT—Norsk Geografisk Tidsskrift. NSWR—Bank of New South Wales Review. PE—Progress of Education. PFG—*Professional Geographer*. PGR—Pakistan Geographical Review. PMAS—Papers of the Michigan Academy of Science. REC—Revue pour l'Etude des Calamités. RGA—Revue de Géographie Alpine. RGL—Revue de Géographie de Lyon (formerly Les Etudes Rhodaniennes). SAJ—South African Geographical Journal. SGA—Svensk Geografisk Årsbok. SGM—Scottish Geographical Magazine. T—Terra. UE—United Empire.

(E)—English Summary. (F)—French Summary. (G)—German Summary. *—Map.

GENERAL GEOGRAPHY AND TRAVEL, N. AHMAD, PGR, No. 1, '54.—Contributions to Geography by Spanish Muslims. K. E. BERGSTEN, SGA, '54.—The Geographical Region (E). W. A. BROWNE, J of G, Feb. '55.—Geographer as co-ordinator. R. O. BUCHANAN, IBG, No. 20, '54.—The I.B.G.: retrospect and prospect. A. DAVIES, GR, Oct. '54.—"Miraculous" discovery of South America by Columbus. G. F. HUDSON, GJ, Sept. '54.—Marco Polo. G. MONTELL, GA, Pts. 1 and 2, '54.—Sven Hedin the explorer. M. PARDE, REC, '54.—Floods in the summer of 1954 (in French). PROF. GEOGR., PFG, Nov. '54.—Mar. '55.—Thesis titles in U.S.A. universities. M. URSULA, J. of G, Apr. '55.—Geography and international understanding. K. A. SINNHUBER, IBG, No. 20, '54.—Central Europe-Mitteleuropa-Europe Centrale: an analysis of a geographical term. J. W. WATSON, SGM, Apr. '55.—Geography—a discipline in distance. J. K. WRIGHT, GR, Jan. '55.—'Crossbreeding' geographical quantities.

MATHEMATICAL GEOGRAPHY AND CARTOGRAPHY, L. P. LEE, NG, Oct. '54.—Oblique Mercator projection. J. R. MACKAY, EG, Jan. '55.—Analysis of isopleth and choropleth class intervals. N. L. NICHOLSON, GB, No. 2, '52.—Survey of single country atlases. P. W. PICKLESIMER, J of G, Oct. '54.—Map needs for a modern world. D. J. PRICE, GJ, Mar. '55.—Medieval surveying and maps. G. R. TIBBETTS, MJTG, Oct. '54.—Early Western cartography and the Arabian peninsula.

PHYSICAL GEOGRAPHY (including Vegetation and Oceanography), J. DARBYSHIRE, MO, Apr. '55.—Wave statistics in the North Atlantic Ocean and on the coast of Cornwall. R. E. HOLTTUM, MJTG, Oct. '54.—Adinandra Belukar: succession of vegetation from bare ground on Singapore Island. A. MATTSSON, SGA, '54.—Interpretation of ice-striae (G). S. SAXOV, GTD, '54.—Movement of the magnetic North Pole (in Danish). C. SWITHINBANK, GJ, Mar. '55.—Ice shelves.

CLIMATE, S. P. JACKSON, SAJ, Dec. '54.—Sea breezes in South Africa. MARINE OBSERVER, MO, July '54.—North Atlantic ocean weather stations. MARINE OBSERVER, MO, Oct. '54.—Meteorological aspects of marine drilling in the South China sea. M. B. OLIVER, J of G, Nov. '54.—Recent changes in concept of broadscale wind and pressure patterns in the Tropics. A. D. PEREJDA, J of G, Mar. '55.—New climatic chart. D. J. SCHOVE, GA, Pts. 1 and 2, '54.—Summer temperatures and tree-rings in N. Scandinavia, A.D. 1461–1950. N. P. SELLICK, SAJ, Dec. '54.—Climate: the observations and their combinations. W. ZINKIEWICZ, AUCS, '53.—Weather complexes (E).

HUMAN GEOGRAPHY, R. AJO, SGA, '54.—Geographic and social patterns of net migration rate. W. E. LE GROS CLARK, A of Sc, Dec. '54.—Reason and fallacy in the study of fossil man. T. HAGERSTRAND, GN, No. 1, '54.—Size and situation of cities (in Swedish). J. M. MAY, GR, Oct. '54.—Map of world distribution of leishmaniasis.* G. VEYRET-VERNER, RGA, Pt. 2, '55.—Répartition des adultes dans le monde.

ECONOMIC GEOGRAPHY, A. CHATELAIN, RGL, No. 2, '55.—Essai sur la classification des industries. A. H. DOERR, J of G, Dec. '54.—Quantitative analysis of locational factors in the integrated and semi-integrated iron and steel industry of the United States and Canada. L. GUERNSEY, J of G, Apr. '55.—Strip coal mining: conservation. T. OUREN, NGT, Pts. 3–8, '51–'52.—Freight balance exemplified by the ports in Trøndelag. V. L. S. PRAKASO RAO, GRI, June '54.—Techniques of area analysis and classification in agricultural regions. W. H. VOSKUIL, J of G, Jan. '55.—Fundamentals of mineral conservation.

TEACHING, M. L. ANDERZHON, J of G, Sept. '54.—Child looks upon the map. T. F. BARTON, J of G, Mar. '55.—Geographic materials strip. J. E. BECHT, J of G, Apr. '55.—Commercial Banking Geography in the college curriculum. J. R. BECK, J of G, Mar. '55.—Travel and field work at $24.17 a week. J. A. BONHAM, J of G, Feb. '55.—Modern geography department in a secondary school. A. V. BURKALOW, J of G, Feb. '55.—Teaching map projections in introductory geography courses. E. COLESON, J of G, Nov. '54.—Application of educational theory to teaching geography. L. DALEN, GN, No. 2, '54.—Pictures in geographical education (in Swedish). R. V. ESMOND, J of G, Dec. '54.—T.V.'s explanation of seasons. G. J. FOSTER, J of G, Oct. '54.—University teaching of cartography. J. W. FOX, NG, Oct. '54.—Geography in Schools: 6. An examiner's viewpoint (New Zealand). GEOGRAFISKA NOTISER, GN, No. 2, '54.—Geography in the 3-year *Realskol* (in Swedish). M. C. GOODMAN, J of G, Dec. '54.—Maps of interest to geography teachers. H. B. JOHNSON, J of G, Nov. '54.—Geography from the grocery shelf. JOURNAL OF GEOGRAPHY, J of G, Apr. '55.—Geography in elementary and secondary curricula (reprint from April 1937). JOURNAL OF GEOGRAPHY, J of G, May '55.—Need for world-wide geographic education survey. E. O. KEENE, J of G, May '55.—New Hampshire field-study course: experiment in resource-use education. L. G. KENNAMER, J of G, Jan. '55.—Unique change in school geography. L. Y. KULKARNI, PE, Mar. and Apr. '55.—Syllabus of local geography in secondary schools. (India) Pts. I and II. L. D. LYNN, J of G, May '55.—*Coast Pilot* as aid to teaching geography. NAT. COUNCIL GEOG. TEACHERS, J of G, Dec. '54.—Televising geography: report no. II. H. PERSSON, J of G, Oct. '54.—Developing global patterns. J. PHELPS, J of G, Apr. '55.—Geography behind the news: experiment in educational television. J. E. SHORT and J. H. COOK, H, Oct. '53.—Experiment in application of an environmental study to the teaching of history. M. SVEC, J of G, Dec. '54.—Experiments with soils. A. I. WARRINGTON, J of G, Sept. '54.—Economic Geography in the Middle South. R. E. P. WASTELL, H, Feb.-June '54.—Wall picture as teaching aid in history. H. N. WHATMAN and C. M. HERBERT, NG, No. 1, '54.—Geography in schools: 5. A brief history of geography in the primary school (New Zealand). K. J. WILLIAMS, J of G, Sept. '54.—Teaching unit: lumbering in Pacific Northwest.

BRITISH ISLES, Physical, J. C. COLEMAN, IG, No. 2, '55.—Caves in the Cong area of Galway and Mayo. R. COMMON, SGM, Dec. '54.—Geomorphology of the East Cheviot area. C. E. EVERARD, IBG, No. 20, '54.—Solent River: a geomorphological study. S. GREGORY, IBG, No. 20, '54.—Accumulated temperature maps of the British Isles. H. H. LAMB, SGM, Apr. '55.—Weather in 1954. S. MARTIN, IG, No. 2, '55.—Raised beaches and their relation to the glacial drifts on the east coast of Ireland. A. A. MILLER, IG, No. 2, '55.—Origin of south Ireland peneplane. A. H. W. ROBINSON, GJ, Mar. '55.—The harbour entrances of Poole, Christchurch and Pagham.

Cultural, J. H. ANDREWS, GR, Jan. '55.—Anglo-American trade in the early eighteenth century. J. H. ANDREWS, IG, No. 2, '55.—Eighteenth-century 'Port Forelands' in the Irish Sea. J. W. BIRCH, IBG, No. 20, '54.—Observations on the delimitation of farming-type regions in the Isle of Man. H. C. BROOKFIELD, No. 2, '55.—Ireland and the Atlantic Ferry. H. CARTER, SGM, Apr. '55.—Urban grades and spheres of influence in south-west Wales. J. T. COPPOCK, IBG, No. 20, '54.—Land-use changes in the Chilterns. J. C. DEWDNEY, SGM, Apr. '55.—Changes in population distribution in the County of Fife. J. B. FLEMING, SGM, Dec. '54.—Analysis of shops and service trades in Scottish towns. T. W. FREEMAN, IG, No. 2, '55.—North Inishowen, County Donegal. J. P. HAUGHTON, IG, No. 2, '55.—Live stock Fair in relation to Irish county towns. C. HINSHELWOOD (Chairman), A of Sc, Mar. '55.—Coal and Britain's future (symposium). R. LAWTON, IBG, No. 20, '54.—Economic geography of Craven in the early nineteenth century. A. R. WANNOP, SGM, Apr. '55.—Weather of 1954 and the Scottish Farmer. E. M. YATES, IBG, No. 20, '54.—Medieval assessments in North-West Sussex.

EUROPE, Physical, H. W. AHLMANN, NGT, Pts. 3–8, '51–'52.—Glaciers and climate in Norway during the last thousand years (in Norwegian). C. F. ALL, SGA, '54.—Pot-hole area of glacial origin in W. Sweden (E). B. G. ANDERSEN, NGT, Pts. 5–6, '54.—Front and lateral moraines in S.W. Norway (E). R. BALSEINTE, RGA, Pt. 2, '55.—Pluviosité en Savoie. A. BERGDAHL, SGA, '54.—Glacial problems in the Gävle district (E). F. BERGSTEN, GA, Pts. 1–2, '54.—Land uplift in Sweden; evidence of old water marks. J. BOISVERT, RGA, Pt. 2, '55.—Neige dans les Alpes françaises. R. H. CHARLIER, PFG, Mar. '55.—Belgian coastal erosion. R. W. FEYLING-HANSSEN, NGT, Pts. 3–8, '51–'52.—Land subsidence in N.W. Vestspitsbergen (E). G. FRODIN, GA, Pts. 1–2, '54.—Distribution of late glacial subfossil sandurs in N. Sweden. E. GIERCZAK, AUCS, '53.—Periglacial phenomena in the vicinity of Lublin (G). A. GUILCHER, RGA, Pt. 2, '55.—Etudes françaises sur les côtes, les sediments et l'hydrologie de la Méditerranée occidentale. F. HJULSTROM, GA, Pts. 1–2, '54.—The Hoffellssandur, glacial outwash plain. Scientific results of expedition to S.E. Iceland in 1951–2 from Geography Department, Uppsala University. JONSSON, J.: Geology; SUNDBORG, A.: Map; HJULSTROM, F.: Geomorphology. B. JAKOBSEN, GTD, '54.—Salt marsh formation in S.W. Jutland. M. MARKGREN, SGA, '54.—Nunataks in Swedish Lapland, Finland and Norway (E). H. MARUSZCZAK, AUCS, '53.—Dolines in the Loess districts of the Lublin plateau (G). J. MORAWSKI, AUCS, '53.—Periglacial phenomena in glacial deposits, Tatary (G). T. WILGAT, AUCS, '53.—Lakes between Leczna and Wlodowa (E).

Cultural, S. AHLFORS, SGA, '54.—Svaltorna ('Starving Area') in W. Sweden (E). L. AMEEN, SGA, '54.—Trends in German industry (G). M. BOYER, RGL, No. 2, '55.—Vie touristique de la Vanoise, I. A. COLEMAN and S. H. BEAVER, GJ, Mar. '55.—Dale-i-Sunnfjord: a study in changing geographical values. B. FULLERTON, IBG, No. 20, '54.—Northern margin of grain production in Sweden in the twentieth century. L. GACHON, RGL, No. 2, '55.—Systèmes agricoles dans les Alpes. GEOGRAFISKA NOTISER, GN, No. 4, '54.—Excursions in West Sweden (in Swedish): Göteborg centre and harbour, Kallebäcks, Nolhagaberget, Brobacka, Kungsbacka (quoting maps). J. HAVUKKAIA, T, No. 4, '54.—Canals on the Saima lake system and traffic (Finland) (G). P. HOLM, GN, No. 3, '54.—Sweden's power problem (in Swedish). J. W. HOUSE, IBG, No. 20, '54.—A comparative study of the landscape of the Plateau de Millevaches and the Western Cevennes. F. ISACHSEN, NGT, Pts. 5–6, '54.—Regional planning in Norway. W. KIRK and F. M. SYNGE, SGM, Dec. '54.—Farms of Verdal, Norway. G. KISH, GR, Jan. '55.—Hydro-electric power in France: plans and projects. G. KISH, PMAS, '53.—Transhumance in S. Italy. A. MELAMID, EG, Apr. '55.—Geographical distribution of petroleum refining capacities: a study of the European refining program. R. E. H. MELLOR, A of Sc, Mar. '55.—Integration of the German refugees, 1945–1953. F. J. MONKHOUSE, EG, Apr. '55.—South Limburg coal field. G. NEY, SGA, '54.—Origin of Reval (Tallinn) (G). B. ODEVING, SGA, '54.—Physical planning of new lands in the Netherlands (E). G. ØIDNE, NGT, Pts. 3–8, '51–'52.—Timber industry in Vest-Agder (in Norwegian). R. PEATTIE, J of G, Nov. '54.—Ruts and routes of Europe: historical geography. Ø. RØDEVAND, NGT, Pts. 3–8, '51–'52.—Emigration from Norwegian farms in 20th century (in Norwegian). T. SHABAD, PFG, Mar. '55.—Geographic developments behind the Iron Curtain. L. M. SOMMERS, NGT, Pts. 3–8, '51–'52.—Fish processing and associated industries of Møre og Romsdal county. L. M. SOMMERS, PMAS, '52.—Norwegian Klipfish industry. A. THORMODSAETER, NGT, Pts. 3–8, '51–'52.—Agriculture in Sunnmøre during industrial development (in Norwegian).

ASIA, Physical, B. BANERJEE, GRI, Sept. '54.—Tea soils of West Bengal. C. D. DESHPANDE and L. S. BHAT, IGJ, Nos. 2 and 3, '54.—The upper Panchaganga Basin: a study in the geomorphology of the Deccan Traps. J. de GRAAFF-HUNTER, GJ, Mar. '55.—Height of Mount Everest. P. P. KARAN, IGJ, Nos. 2 and 3, '54.—Aspects of the geomorphology of India and Pakistan. A. SITA, IGJ, Nos. 2 and 3, '54.—Erosion in gneissic region south of Madras. F. K. KHAN, IGJ, Nos. 2 and 3, '54.—The waterfalls of the Chotanagpur Plateau: a study in geographical geomorphology.

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